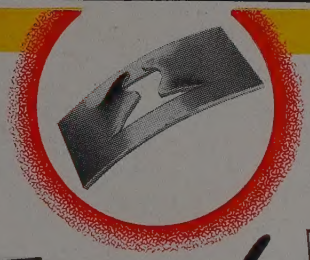
June 2, 1947

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 63



THIS and IS A SPEED NUT

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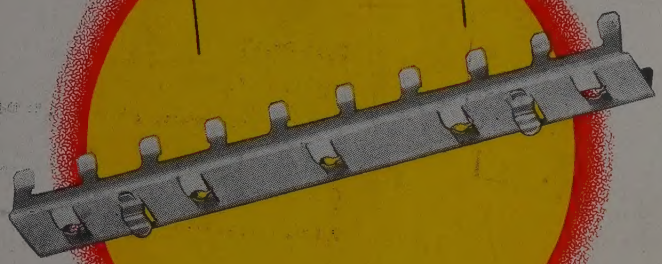

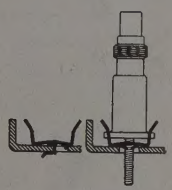

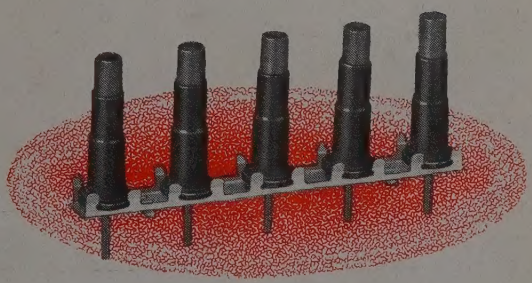

THIS *is also a* SPEED NUT

In fact, it's five SPEED NUTS combined into one, to simplify and improve the assembly of multiple coil forms on radios. This one ingenious fastener replaced eight separate parts and eliminated drilling and tapping. It retains the tuning cores and screws, provides exactly the right tension on the screws, and its spring arms hold the plastic coil tubes securely in place.

SPEED NUT brand fasteners may be the answer to your assembly problems, too. Send in your engineering details and we'll give you a complete, no-charge fastening analysis.

TINNERMAN PRODUCTS, INC. • 2039 FULTON ROAD • CLEVELAND, OHIO

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Speed Nuts PATENTED

MORE THAN 4000 SHAPES AND SIZES

Trade Mark Reg. U. S. Pat. Off.

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HYDRAULIC PRESS

By AETNA-STANDAR

DESIGNERS AND BUILD
to the Steel, Non-Fer
and Chemical Indust

★ HAS MANY NEW DESIGN FEATURES ★

- Open throat.
- High ram lift.
- Adjustable ram pressure from zero to maximum press capacity.
- One-piece construction — no bolted connections.
- All welded, stress relieved construction.

— Available in Four Sizes!

Aetna-Standard, renowned for seamless tube mills and many production machines, *now offers to the trade, a versatile, hydraulic press.* Designed for a specific application, this press can be easily adapted to diversified operations on ferrous and non-ferrous materials . . . light forging, moulding, hot die work, hot and cold forming, straightening and high pressure forming. The press has proved a standout in service.

The designers, specialists in mill equipment, incorporated several outstanding features. The ram pressure moves from zero to maximum press capacity. An automatic dual pump system permits rapid approach and high pressure work stroke.

Aetna-Standard's traditional rugged, rigid, long-wear quality is reflected in this press. The main frame and table is one-piece construction . . . no bolted connections to shake loose. The all-steel cylinders have centrifugally cast manganese bodies.

Speeds range from 4 ft. to 10 ft. per minute with high return speeds. Available in four sizes — 25, 50, 150 and 250 tons.

Complete information promptly upon request.

used for:

- MOULDING
- HIGH PRESSURE FORMING
- HOT DIE WORK
- LIGHT FORGING
- HOT AND COLD FORMING
- STRAIGHTENING

THE AETNA-STANDARD ENGINEERING CO.
YOUNGSTOWN, OHIO

ASSOCIATED COMPANY:
HEAD, WRIGHTSON & CO., LTD., THORNABY-ON-TEES, ENGLAND

NEW USES EVERY DAY FOR Cold-Formed Shapes

For example, take the Bethlehem Cold-Formed Shape shown here. Supplied to the customer in straight 12-ft lengths, it is cut to size and notched, formed into a ring, pressure-welded, machine-finished, then cut in half. What's the result? . . . a bearing channel for use in automobile motors.

Bearing channels are but one of a long line of products now being made from Bethlehem Cold-Formed Shapes. In fact, so varied are the items in which these shapes can be used to advantage that it's difficult to tell in what field they'll turn up next. Scores of manufacturers are continually discovering new applications for them, new economies through their use.

Made from steel sheets, strip or plates, Bethlehem Cold-Formed Shapes are more uniform in thickness than those produced by older methods. Easy to precision-form, they also provide an excellent surface. We make them on presses, brakes or rolls—in all styles, in all gauges from 7 to 24, inclusive, and in any length.

Before you decide on the answer to any metal-shaping problem, talk over the advantages of Cold-Formed Shapes with Bethlehem. Contact the nearest Bethlehem district office, or write us at Bethlehem, Pa.

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BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

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Proved through the years the smoothest-operating, fastest light "on track" machine built.

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1. ANTI-FRICTION BEARINGS THROUGHOUT.
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CATALOG 78 GIVES THE DETAILS. SEND FOR IT.

ORTON CRANE & SHOVEL COMPANY
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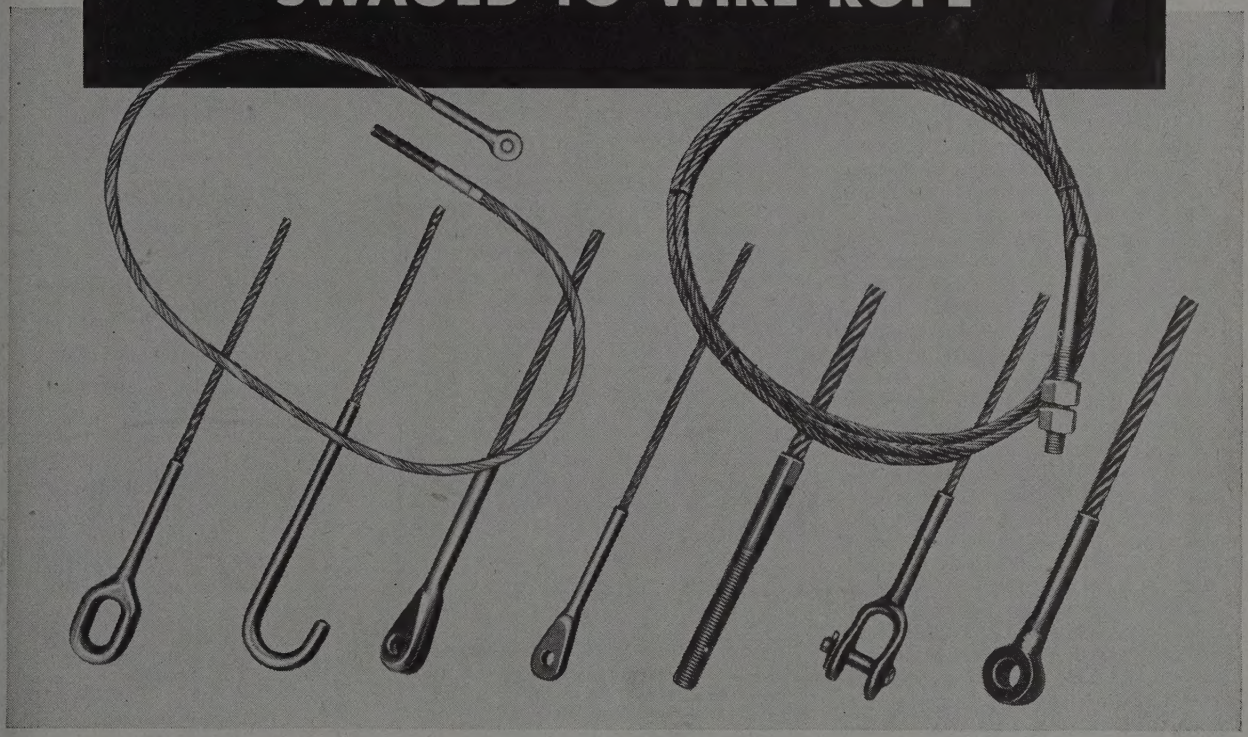
POWER

MACWHYTE "SAFE-LOCK" FITTINGS SWAGED TO WIRE ROPE



Fast, sure, safe, flexible cable controls for direct connection to your equipment

. . . custom-built to your specific needs!

For controls on mechanical products and machinery, for operating counterbalances, for mining machinery, for yacht rigging, in fact wherever wire rope is used, these units or assemblies are flexible, easy to handle, and safe.

They are available in a wide range of types and sizes from 500 pounds up to 100,000 pounds breaking strength.

All assemblies are made to your specification in any length required.

Just tell us how you would like to use a flexible, safe, wire rope control unit, and Macwhyte engineers will plan with you to obtain the best for your needs. Write to Macwhyte Company, Kenosha, Wisconsin, or any of our distributors, mill depots, or factory representatives throughout the United States.

Here is a Macwhyte "Safe-Lock" fitting cut to show how fitting and wire rope are swaged together.

These "Safe-Lock" swaged fittings can be attached to bright, galvanized, or tinned carbon steel, Stainless Steel, or Monel Metal wire ropes. The "Safe-Lock" fittings themselves are available in Stainless Steel, bright, or cadmium plated carbon or alloy steels.

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2912 Fourteenth Ave., Kenosha, Wisconsin
Wire Rope Manufacturers

Mill Depots: New York • Pittsburgh
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MACWHYTE PREformed and Non-PREformed Internally Lubricated Wire Ropes . . . MONARCH WHYTE STRAND Wire Rope . . . Special Traction Elevator Rope . . . ATLAS Braided Wire Rope SLINGS . . . Hi-Fatigue Aircraft Cables, Assemblies, Tie-Rods . . . Stainless Steel Wire Rope . . . Monel Metal Wire Rope, Galvanized Wire Rope

Behind the Scenes...

Railroading the Porter

One of the best tales we've heard lately concerns a group of travelers on a certain railroad which skirts the shores of Lake Erie from Cleveland to Buffalo. At certain times of the week, the Pennsylvania state law prevents the sale of liquor—and since the train passes through a small corner of Pennsylvania, the bar closes from the time it hits a certain town until it passes through another certain town. Seems that on the club car during one of these dry passages one rider had a brilliant idea. Knowing that at 11:10 p.m. the train was scheduled to emerge into wet country again, he conspired with several other passengers on the car to advance their watches to 11:20. Then he called to the porter in a loud voice for a drink. The porter came in, explained all, and that he couldn't serve until that certain town was reached. "Well", said the passenger, "We've passed through there, because my watch says 11:20." The porter was a little confused, consulted with his own watch which said 10:20. Other passengers all checked their watches, whereupon the porter decided something was wrong and opened the bar. Wasn't until the conductor came through some minutes later that the gag came out, at which time all the smug passengers were enjoying their illegal drinks, much to the discomfort of the porter!

Here's the Opener

This week brings with it the opening gun in STEEL's series of articles leading up to the Machine Tool Show. Guy Hubbard, Machine Tool Editor, is preparing all twelve of the articles which will wind up with the big Machine Tool Issue on Sept. 1. This week's story on "What the Machine Tool Show Means to Metalworking Executives" appears on page 98 and will give you a small idea of the importance of the Event of the Year in metalworking circles. Better check this one over, and keep your eyes peeled for the following articles. They'll be well worth while!

Short and Nostalgic

One of the shortest letters we have received in a long time came across our little orange-crate desk last week. From a New York outfit, it said simply, "Who make machinery for cut nails?" That one might have been easy, but it had us stumped for a few minutes. Seems that cut nails are still an item in the trade—or perhaps we should say again, because once on a time there were no nails but cut nails, cut by hand and expensive. More recently, there were practically no cut nails available. A handful of companies produced them for very special purposes, one of them being for blacksmiths who used them for shoeing horses and another being furniture companies who wanted to achieve that look of authenticity in early period pieces. During the war, the Chinese built amazing military works with cut nails, only some of our Army people couldn't understand why they had to ship sheet steel for Chinese nails—Why they couldn't use wire just like any other nail maker. We are still somewhat in the dark about a possible expanding market in cut nails right now, but if there is one, we'd like to hear about it.

Formula Wanted

Anybody have a "rule-of-thumb" method of determining the approximate tonnage of a press? From up New England way comes a plea for verification or rejection of the formula that the diameter of the crankshaft squared multiplied by 3.5 gives approximate tonnage rating. We'll confess we don't know the answer to that one. If you know a better one, or if you know that one is right, let us know and we'll pass the dope along to our friend Pete, who is looking for the answer.

Round The World Fans

Since this is the off week for Puzzle Corner, we'll pause just long enough to announce that we have now gone international. Yes, fellow puzzlers, we have members in England and Brazil who have sent in answers to our puzzles. The Brazilian we have been wondering about. He must be a Mohammedan, because he goes to great lengths to point out that in our problem of the railroad on the equator, if it actually pointed toward Mecca as we stated, the answer might be infinitesimally incorrect, since Mecca is located somewhat north of the equator and the track therefore couldn't be exactly east and west. We'll take a weak slap on the wrist for the sake of the purists listening in!

Shrdlu

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STEEL
Vol. 120—No. 22 June 2, 1947

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Editorial Staff on Contents Page

★

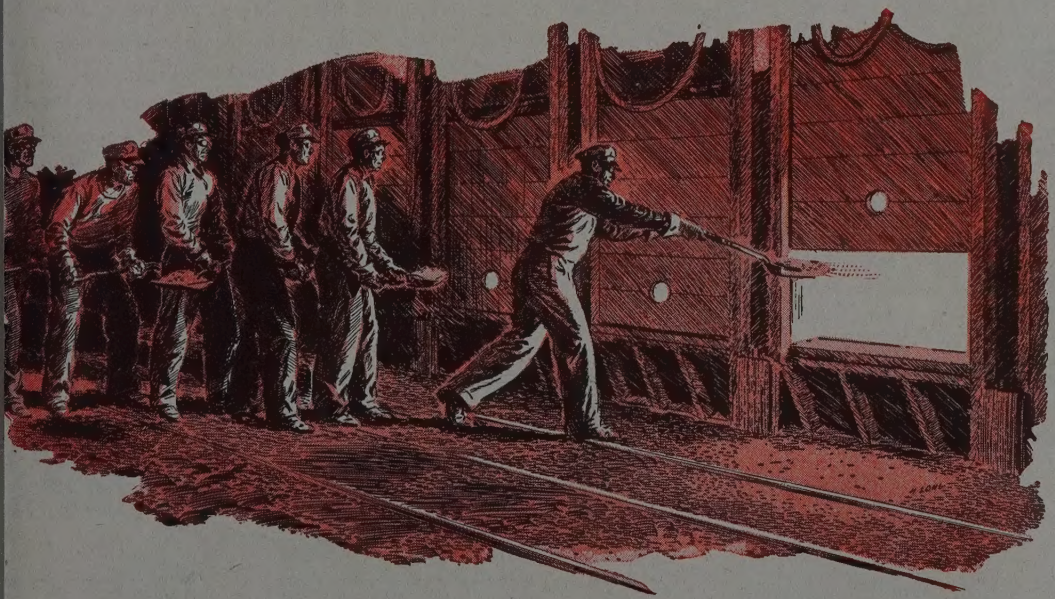
SETS FAST, STAYS FAST

BASIC FURNACE
REFRACTORIES

FOR many years our dead burned dolomite products, Magnefer and Syndolag, were identified with this terse summary of properties —"Sets Fast, Stays Fast."

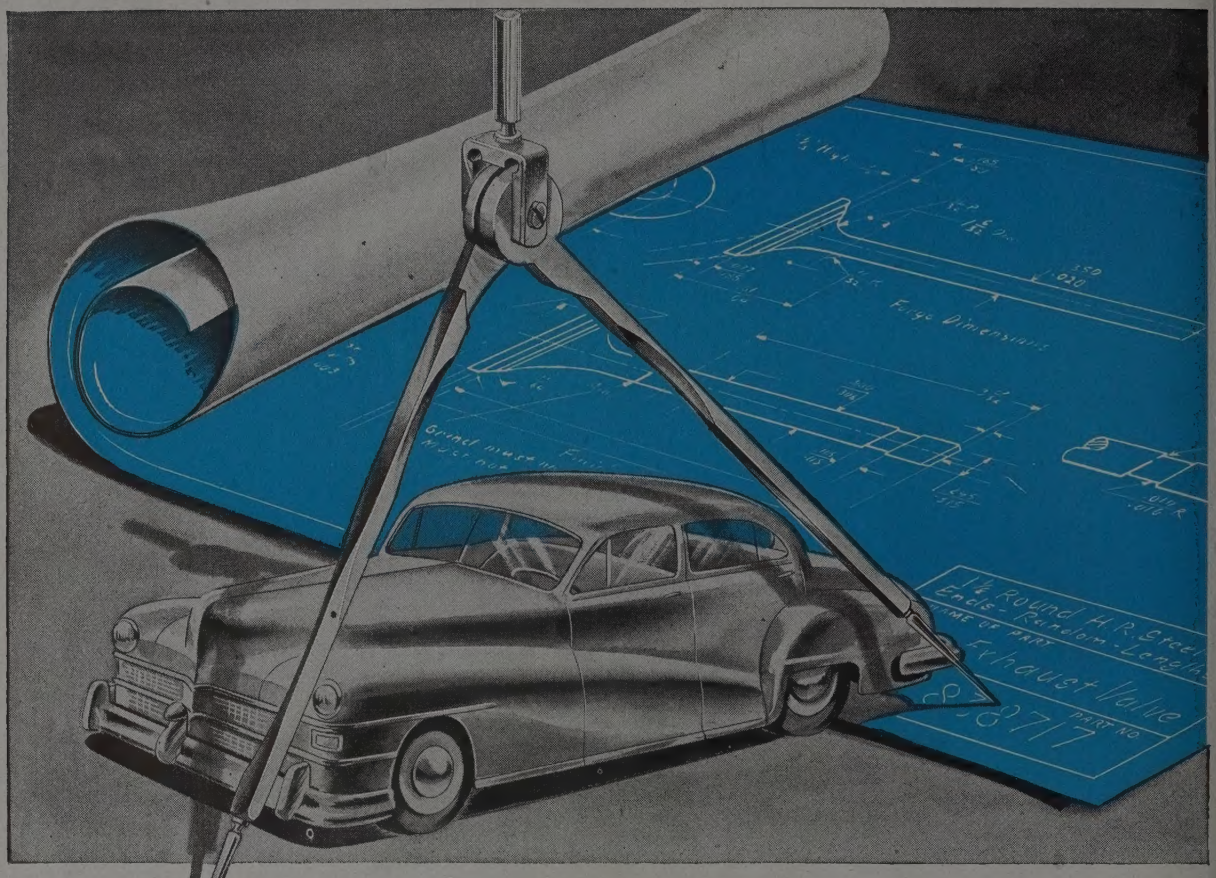
Today, as then, the use of dead burned dolomite recommends itself to cost and quality conscious steelmakers who readily admit the benefits of a refractory which—

—is thoroughly shrunk to minimum porosity—is resistant to hydration and could be stored under satisfactory conditions for months —sets rapidly due to the presence of coalescing agents into a dense monolithic mass under normal furnace operating conditions—reduces furnace fettling time and thus increases production—minimizes the possibility of introducing magnesia into the slag with consequent hindrance to the refining of the steel.



Basic Refractories Incorporated 845 HANNA BUILDING, CLEVELAND 15, OHIO

Exclusive Agents in Canada: REFRACTORIES ENGINEERING AND SUPPLIES, LTD., Hamilton and Montreal



ALL THE GOOD NEWS COMES FROM PRODUCTION EFFICIENCY

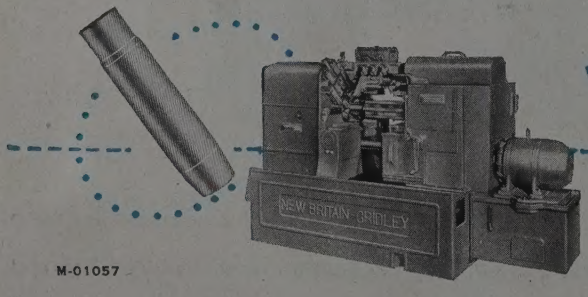
PAYING for higher wages and maintaining profits by raising prices is a sure formula for stagnation.

Lowering prices at the expense of wages or earnings on investors' savings produces the identical result.

Lower *costs*, resulting from *greater manufacturing efficiency*, is the answer. Here is something management and labor agree on wholeheartedly. But you don't *get* it by agreeing about it.

Engineers, by designing new automatic machines, new tools, and new set-up methods, have offered the key to solving the problem. It's up to management to make these better machines and methods available. It's up to the man at the machine to use that machine for all it's worth.

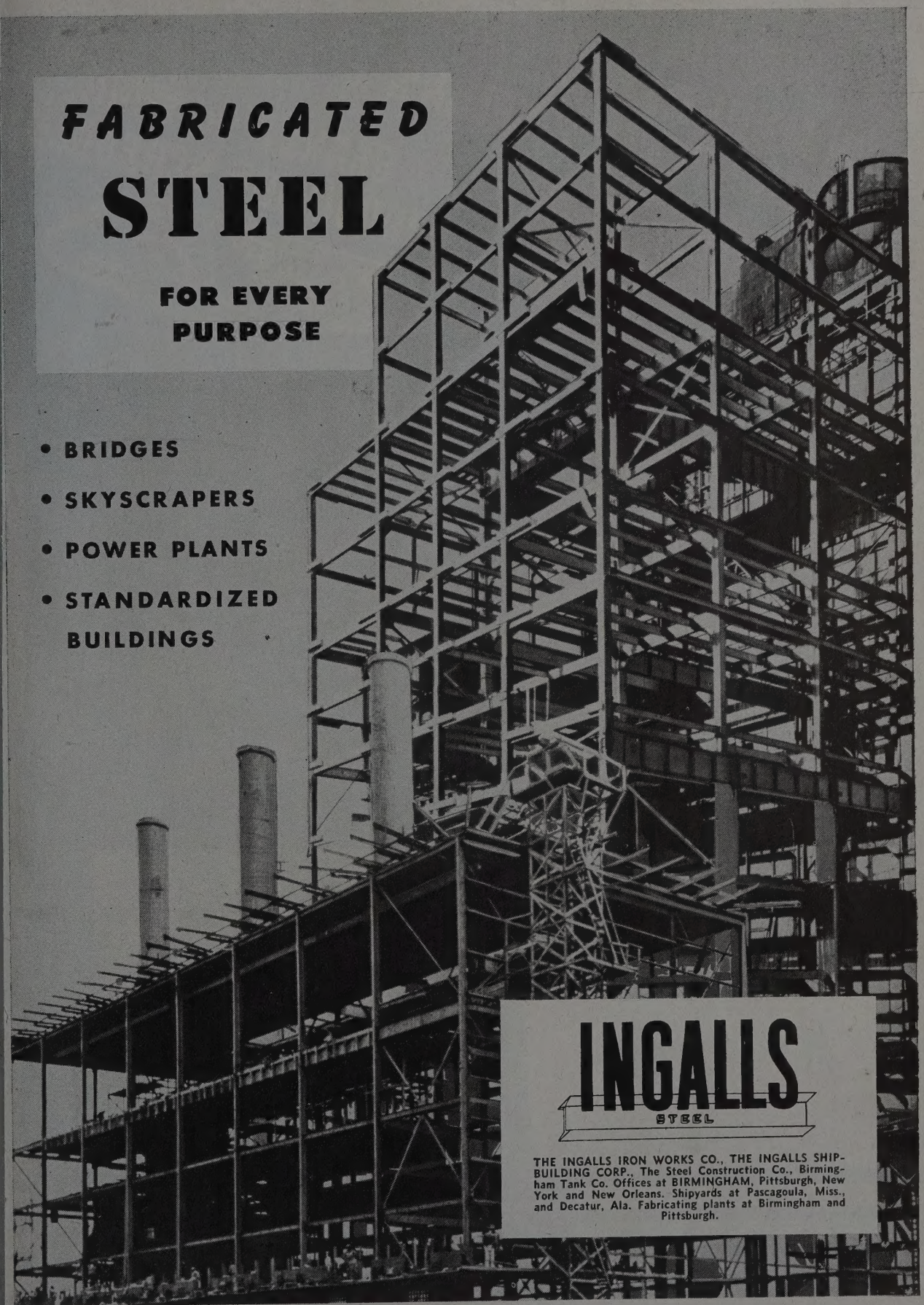
EXAMPLE: Formerly a leading automotive manufacturer found it necessary to rough grind the O.D. of this valve stem guide, machine the I.D. and then finish grind the O.D. Today the outside diameter is finish ground before being magazine fed into a Model 60 New Britain screw machine, which turns out over 406 pieces per hour with concentricity between inside and outside diameters well within the required .002 total indicator reading. Here is a sound saving, which, repeated in thousands of thousands of parts makes an important contribution to lowered costs.



M-01057

New Britain
Automatics

THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN-GRIDLEY MACHINE DIVISION
NEW BRITAIN, CONNECTICUT


FABRICATED
STEEL
FOR EVERY PURPOSE
• BRIDGES
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• POWER PLANTS
• STANDARDIZED BUILDINGS
INGALLS
STEEL
THE INGALLS IRON WORKS CO., THE INGALLS SHIPBUILDING CORP., The Steel Construction Co., Birmingham Tank Co. Offices at BIRMINGHAM, Pittsburgh, New York and New Orleans. Shipyards at Pascagoula, Miss., and Decatur, Ala. Fabricating plants at Birmingham and Pittsburgh.

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GEARED to YOUR PRODUCTION SCHEDULE

Modern CLEVELAND

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Although, in most instances, the wide range of standard sizes and capacities in which this popular line of Modern Four Point Presses can be furnished, is sufficiently large and varied to meet the needs of most Power Press users, our ability to furnish Modern Four Point Presses is not confined to standard machines and we are prepared to furnish Presses "engineered to YOUR specifications and geared to YOUR production."

Whatever you produce in the line of pressed metal products—whether large or small—you will find that the use of Modern Cleveland Single Point, Two Point or Four Point Presses will enable you to obtain greater efficiency, lower costs and more assured uniformity because Cleveland Presses are designed for accuracy of production and economy of operation.

Why not investigate the advantages of Modern Presses, "engineered to YOUR specifications and geared to YOUR production"?

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4-108-50D—Stroke 24", Adjustment 6" bed area 70" x 108", capacity 500 tons.

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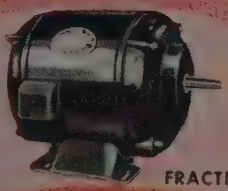
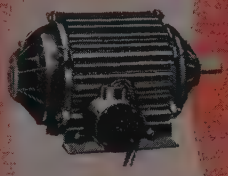
"Truly a Lifetime Motor" ©



FRACTIONAL HP
REP.-IND. TYPE

INTEGRAL HP
DIRECT CURRENT
MOTORS

INTEGRAL HP
POLYPHASE AND
REP.-IND TYPE



INTEGRAL HP
EXPLOSION PROOF
NON VENT

INTEGRAL HP
ENCLOSED
FAN COOLED TYPE

DEPENDABILITY LONG LIFE
B
LINE
ECONOMY

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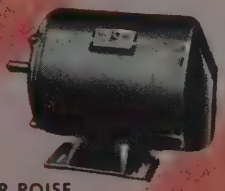
FRACTIONAL HP
EXPLOSION PROOF
FAN COOLED



POWER POISE
FRACTIONAL HP
CAPACITOR TYPE

FRACTIONAL HP
EXPLOSION PROOF
NON VENT

WRITE FOR
MOTOR BULLETIN 5000
GRINDER BULLETIN 7000

THE BROWN-BROCKMEYER COMPANY

LEADING INDEPENDENT MOTOR MANUFACTURER

1030-1048 SMITHVILLE ROAD

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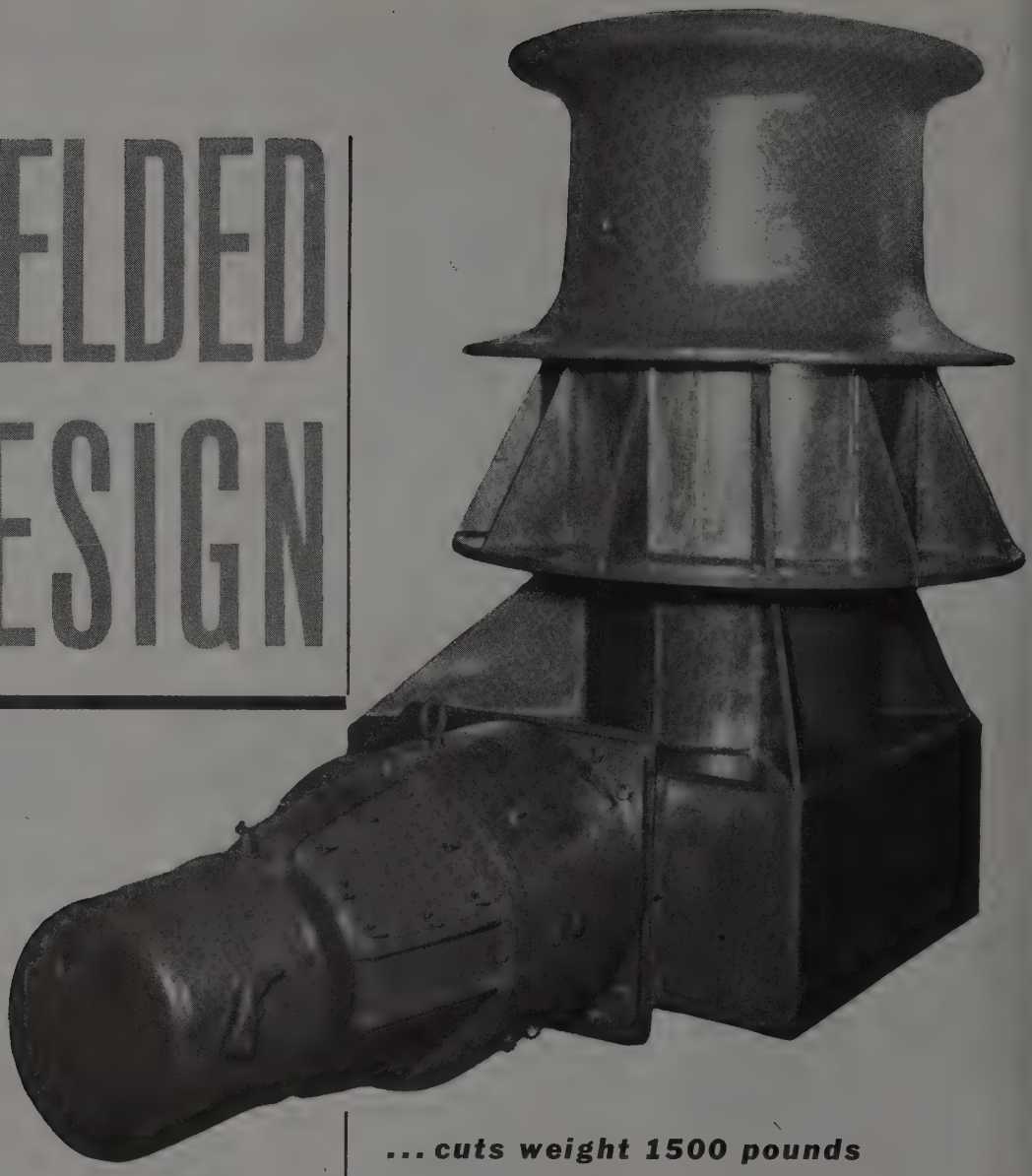
PLANTS AT DAYTON, WILMINGTON, WASHINGTON AND XENIA, OHIO—OFFICES IN PRINCIPAL CITIES

WELDED DESIGN



... cuts weight 1500 pounds
... cuts cost $1700

An interesting example of the wide design possibilities offered by arc welding is this windlass built by the Ideal Windlass Company of Attleboro, Mass. This giant piece of equipment represents a combination of ingenious design with sound engineering to develop a product that is strong, relatively light in weight, and inexpensive.

By combining the particular advantages of casting with the advantages of welding, the windlass was built at a 54% reduction in cost, and a 25% reduction in weight – $3,000 as against $1,300, and 6,000 pounds as against 4,500 pounds.

In the same way, you can effect many important economies in weight, building-time and materials by the use of oxyacetylene flame-cutting and arc welding to unite separate parts. Plan welded design for your next job.

Air Reduction's Technical Sales Division will help you with any design problem concerning the use of these processes. For full details, write: Dept. S-6114, Air Reduction, 60 East 42nd St., New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas.

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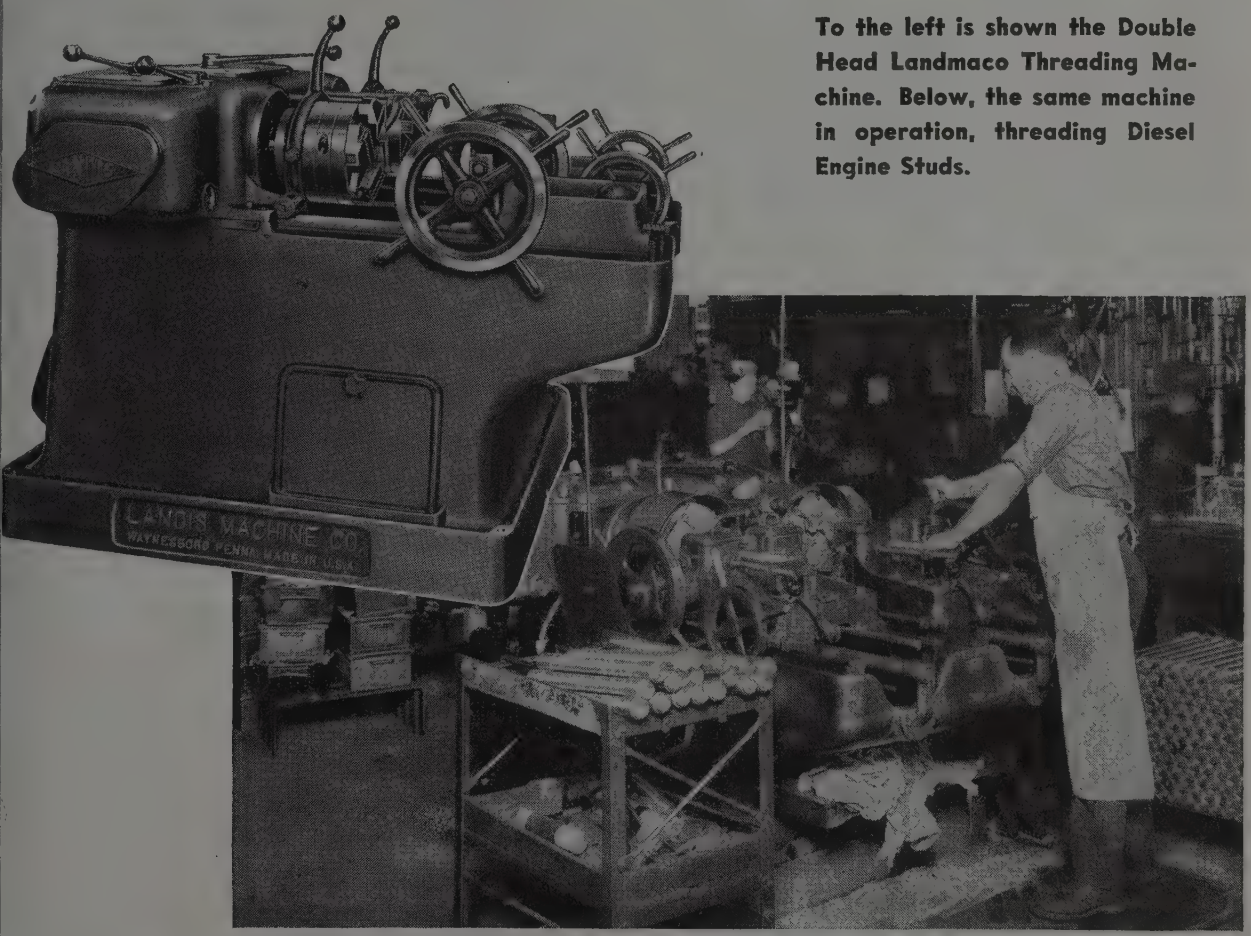
Assures the Fine Threading Accuracy Required for Diesel Engine Studs

Cylinder Head Studs of the Diesel Engine are made from heat-treated alloy steel and present a difficult threading operation. The threads must be held to extremely close tolerance specifications.

Manufacturers of these parts using Landmaco Threading Machines have no difficulty in meeting the specifications.

To the left is shown the Double Head Landmaco Threading Machine. Below, the same machine in operation, threading Diesel Engine Studs.



Write for Bulletin H-75

LANDIS MACHINE COMPANY

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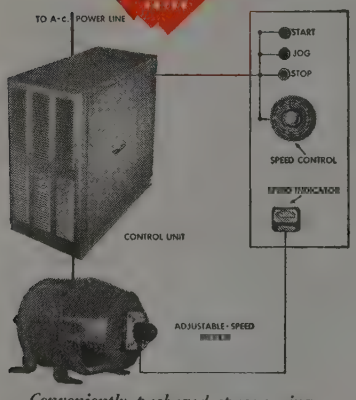
Unlimited Flexibility

Unlimited flexibility of control is provided by the V★S system for this Silicon Steel Slitting Line.



Conveniently-packaged, space-saving V★S Drive are available from 1 to 200 hp.

. . . with Reliance V★S Drive

Such functions as quick, smooth starting and stopping, stepless speed changing, maintenance of proper tension, and reversal at any point desired are handled by this *All-electric, Adjustable-speed Drive* right from your plant's A-c. circuit. Through automatic or manual control—at the machine or from remote stations—Reliance V★S Drive brings *unlimited* flexibility to any processing operation. Thousands of installations are proving every day that V★S on the job means greater production and lower costs. That's why it will pay you to write today for Bulletin 311 which contains more important facts about V★S Drive.

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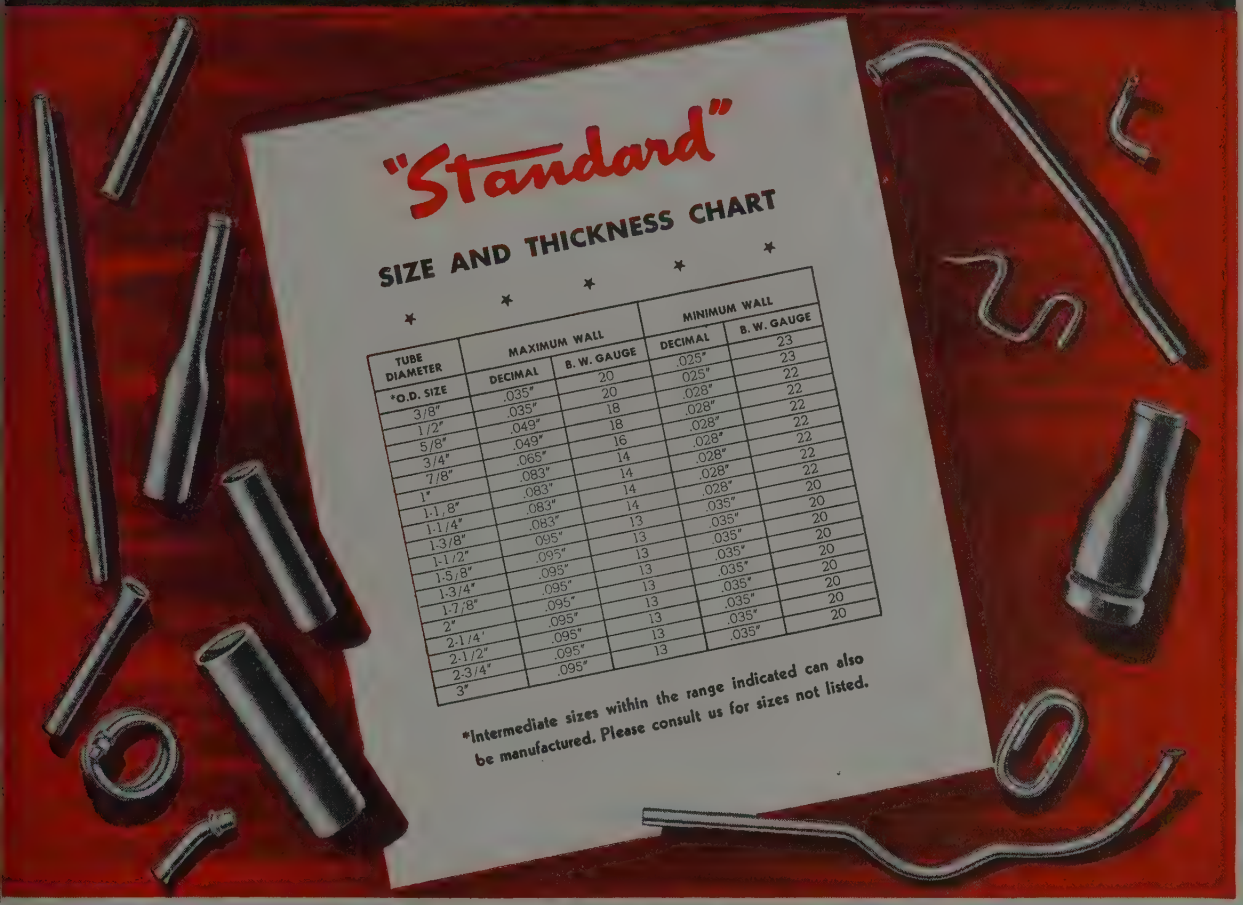
NOW AVAILABLE
"Standard"
WELDED STAINLESS STEEL TUBING



TUBE DIAMETER	MAXIMUM WALL		MINIMUM WALL	
*O.D. SIZE	DECIMAL	B. W. GAUGE	DECIMAL	B. W. GAUGE
3/8"	.035"	20	.025"	23
1/2"	.035"	20	.025"	23
5/8"	.049"	18	.028"	22
3/4"	.049"	18	.028"	22
7/8"	.065"	16	.028"	22
1"	.083"	14	.028"	22
1.1/8"	.083"	14	.028"	22
1.1/4"	.083"	14	.028"	20
1.3/8"	.095"	13	.035"	20
1.1/2"	.095"	13	.035"	20
1.5/8"	.095"	13	.035"	20
1.3/4"	.095"	13	.035"	20
1.7/8"	.095"	13	.035"	20
2"	.095"	13	.035"	20
2.1/4"	.095"	13	.035"	20
2.1/2"	.095"	13	.035"	20
2.3/4"	.095"	13		
3"				

*Intermediate sizes within the range indicated can also be manufactured. Please consult us for sizes not listed.

Many Analyses for Numerous Applications

With more than a quarter of a century experience in the manufacture of Welded Carbon Steel Tubing, we have now added to our line, "Standard" Stainless Steel Tubing produced by the atomic Hydrogen Welded process.

"Standard" Stainless Steel Tubing can be furnished in the various analyses such as Type 302 - 304 - 316 - and 347.

"Standard" Stainless Steel Tubing is available for Mechanical, Pressure, Structural and Ornamental applications. Specify "Standard" and get the best.

STANDARDIZE WITH "STANDARD"—IT PAYS

THE STANDARD TUBE CO.
Detroit 3, Michigan
Welded Tubing — Fabricated Parts
STANDARDIZE with "STANDARD"—It Pays

Also Producers of Electric Welded Tubing

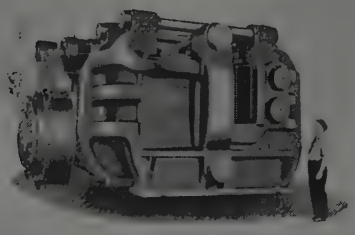
★ *Complete Tube Stocks Maintained by* ★
STANDARD TUBE SALES CORP., One Admiral Ave., Maspeth, L. I., N. Y.
LAPHAM-HICKEY COMPANY, 3333 W. 47th Place, Chicago 32, Ill.
UNION HARDWARE & METAL CO., 411 E. First St., Los Angeles 54, Cal.
THE PACIFIC PIPE COMPANY, 160 Spear St., San Francisco 5, Cal.
METAL GOODS CORPORATION, 1300 Burlington, North Kansas City, Mo.

RESOURCEFULNESS

This Magneto Drive Shaft is an example of how National Forging Machines and National technique "team up" to solve difficult forging problems.

Close tolerances, low weight, minimum finish, proper grain flow and greater output are National advantages that merit your serious consideration.

May we help you investigate?



NATIONAL
MACHINERY COMPANY
TIFFIN, OHIO.

DESIGNERS AND BUILDERS OF
MODERN FORGING MACHINES—MAXIPRESSES—COLD HEADERS—AND BOLT, NUT, RIVET AND WIRE NAIL MACHINERY

New York Detroit Chicago

PROTECTION WHERE NEEDED

: Glove Blucher. Com-
on Cord and Leath-
ole, Rubber Heel.
ivery-at-once.

. Insure Workers Feet In Sure Protection

with HY-TEST *Safety Shoes*

Even the primitive warrior dressed for danger. Workers should do no less. It's easy for them to guard against toe injuries by wearing Hy-Test Safety Shoes. The Anchor-Flange Steel Box Toe wards off falling objects that could cripple for life. Sturdily constructed with all leather in vital parts, Hy-Test Safety Shoes give long-lasting protection and complete comfort in every step. They're available in sizes 5 to 15, in widths AA to EEE.

ANCHOR FLANG
STEEL BOX TOE

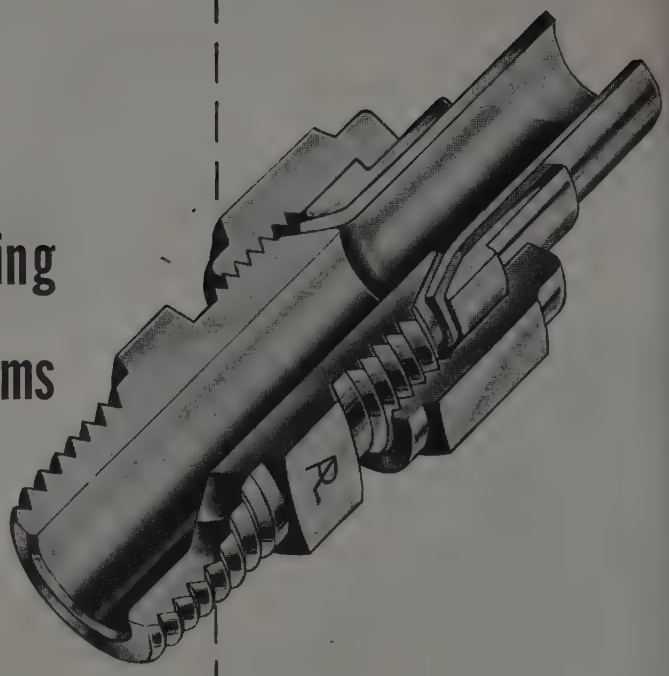
This flange adds extra strength to the steel arch's sidewall. Anchored between insole and outsole, it also serves to resist crushing, tilting, and cutting through outside under impact.

THE WORLD'S LARGEST SELLING SAFETY SHOE

HY-TEST *Safety Shoes*

HY-TEST DIVISION • INTERNATIONAL SHOE COMPANY • ST. LOUIS 3, MO. • EASTERN OFFICE • MANCHESTER, N.

This Parker Tube Fitting makes Free Flow systems possible



It takes *tubing* to achieve Free Flow. Tubing can be bent . . . can be connected without creating pockets that cause turbulence. Fewer fittings are required—resulting in fewer chances of leaks.

With PARKER Tube Fittings there's no threading on the tubing. You can use light or heavy tubing. Connections are pressure-tight—protected against leakage, vibration and shock—the result of **precision** manufacture.

With no threading on the job—installation and removal are quick and easy.

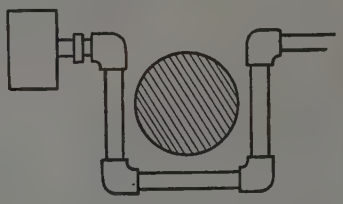
For simplified, Free Flow systems, use tubing with PARKER Fittings and Valves. And remember, *every* PARKER Fitting is a *coupling*.

Let PARKER work with you on your systems to carry liquids or gases, under high or low pressure.

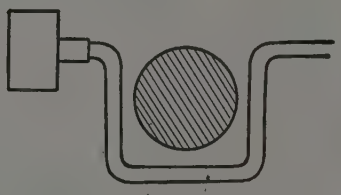
THE PARKER APPLIANCE COMPANY
17325 Euclid Avenue • Cleveland 12, Ohio
Offices: New York, Chicago, Los Angeles, Dallas, Atlanta
Distributors in Principal Cities

Parker
TUBE FITTINGS • VALVES

FREE FLOW—a comparison



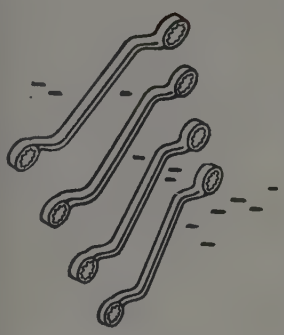
OLD METHOD—Each connection threaded—requires numerous fittings—system not flexible or easy to install and service. Connections not smooth inside—pockets obstruct flow.

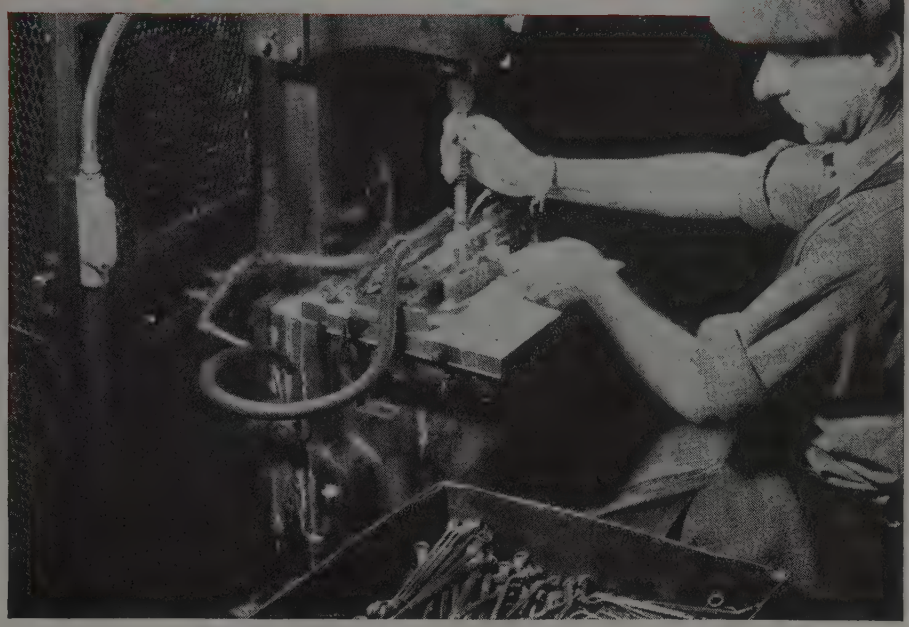


MODERN METHOD—Bendable tubing needs fewer fittings—no "threading on the job"—system light and compact—easy to install or service—no internal pockets or obstructions to free flow.

Write for interesting booklet "Fluid Power".

Alloy Steels





Save Weight

WITHOUT LOSS OF VITAL STRENGTH

Wrenches and other hand tools must be easy to handle—light in weight and thin in section—but strong, too. That's why so many manufacturers now are using alloy steels.

Alloy steels are a "natural" for applications such as this. Their high strength-to-weight ratio permits the use of thinner sections to save weight and to hold down size—*without any sacrifice of needed strength.*

Other advantages of these fine steels are important to designers and engineers, too. They are unsurpassed in their uniform response to hardening treatment—resist wear. They are tough—withstand severe shock and strain. They resist fatigue—insure safety. And, in stainless grades, they resist corrosion as well as oxidation at high temperatures.

Why not learn NOW what alloy steels can do to improve your products? Republic—world's leading producer of alloy and stainless steel—is well qualified and ready to tell you.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • *Massillon, Ohio*
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

REPUBLIC STEEL

Republic
ALLOY STEELS

Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Plates, Pipe, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

ONLY the SIDE of a V-BELT *Grips the Pulley!*

—That's why the SIDE is what really *Gets the WEAR!*

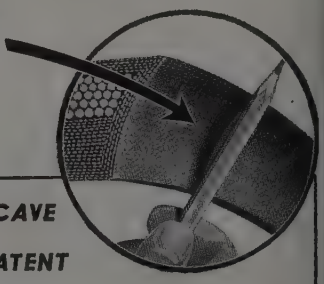
Look at a V-Belt in its sheave and you see at once that the *sides* of the belt do all the gripping on the pulley and get all the wear against the sheave-groove wall.

Notice, too—it's the *sides* that pick up all the power delivered by the driver pulley. The sides *transmit* that power to the *belt as a whole.*

And then, once more, its the sides—and the sides *alone*—that grip the driven pulley and *deliver* the power to it.

That is why you have always noticed that the sidewall of the ordinary V-Belt is the part that wears out first.

—*and here is how the* CONCAVE SIDE ★REDUCES Sidewall WEAR Giving You Much Longer Belt Life!



Clearly, since the sidewall is the part that wears out first, anything that prolongs the life of the sidewall will lengthen the life of the belt. The simple diagrams on the right show exactly why the ordinary, straight-sided V-Belt gets excessive wear along the *middle* of the sides. They show also why the Patented Concave Side greatly reduces sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belts can possibly give.

★*More Important NOW That STRONGER Tension Members are Used!*

Now that Gates *Specialized* Research has resulted in V-Belts having much stronger tension members—tension members of Rayon Cords and Flexible Steel Cables, among others—the sidewall of the belt is often called upon to transmit to the pulley much heavier loads. Naturally, with heavier loading on the sidewall the life-prolonging Concave Side is more important today that ever before!

The CONCAVE SIDE is a GATES PATENT

Straight Sided V-Belt

How Straight Sided V-Belt Bulges When Bending Around Its Pulley

You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with Patented Concave Sidewall

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt Is Bending Over Pulley.

No Bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt.

476

THE GATES RUBBER COMPANY, DENVER, U. S. A.
"World's Largest Maker of V-Belts"

GATES VULCO V-ROPE DRIVES

Engineering Offices and Jobber Stocks **IN ALL INDUSTRIAL CENTERS** of the U. S. and 71 Foreign Countries

Gates
REG. U.S. PAT. OFF.
THE MARK OF SPECIALIZED RESEARCH

Solving AIR COMPRESSOR TROUBLES

Lubrication Engineer's Report:

"A mining company* in the Joplin area was having trouble with the unloading valve on an Angle Compound Air Compressor. They were also troubled with discharge valve breakage of the high pressure cylinder.

Case No. 1:

"The previous oil was replaced with Cities Service North Star Oil No. 5 and not a single instance of gumming or sticking or trouble of any kind with the unloading valve or discharge valve has been reported in over two years."

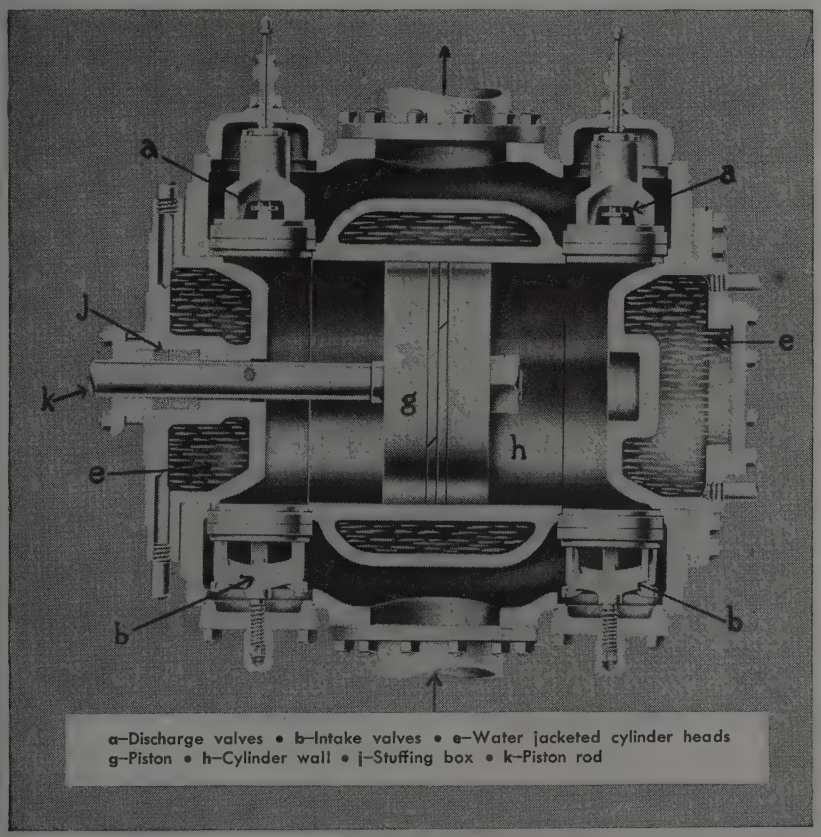
Case No. 2:

"A utility plant* in Springfield, Mo., uses compressed air from a single stage belt-driven air compressor in connection with overhauling jobs of the boilers in their plant. They are all of the water tube type and are overhauled at regular intervals. During these overhauls they need a constant supply of air. The unloading valve of this compressor would gum up to the extent that they would have to clean it about every other day when using a competitor's oil. I sent them a drum of Cities Service North Star Oil No. 5 about a year ago, and checked with their Chief Engineer last month. He tells me they haven't had to clean the unloading valve since putting in the North Star Oil."

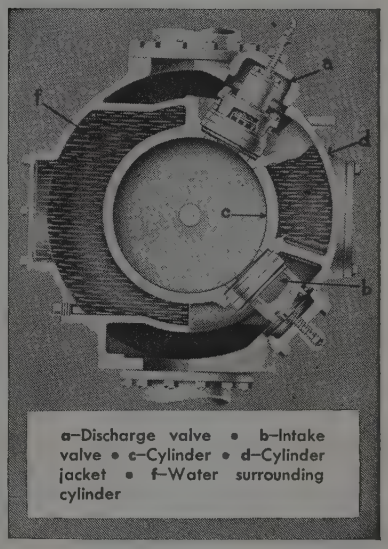
Case No. 3:

"We have lubricated a 1000 cubic foot two-stage air compressor in the Mid-Continent area for over three years. The customer* says that in using Cities Service North Star Oil No. 5 in this compressor he hasn't had any valve breakage and that carbon deposit on valves and seats has been down to practically nothing."

**Names on request.*



a–Discharge valves • b–Intake valves • e–Water jacketed cylinder heads
g–Piston • h–Cylinder wall • j–Stuffing box • k–Piston rod



a–Discharge valve • b–Intake valve • c–Cylinder • d–Cylinder jacket • f–Water surrounding cylinder

Solving compressor operating problems has been Cities Service's special forte for years. A phone call or card to the Cities Service office nearest you will bring this engineering experience to *your* plant. There is no obligation.

Free Booklet:

For useful information that every air compressor owner and operator should know, write for our free booklet, "Air Compressor Lubrication." Cities Service Oil Co., Sixty Wall Tower, New York 5, N. Y., Room 121

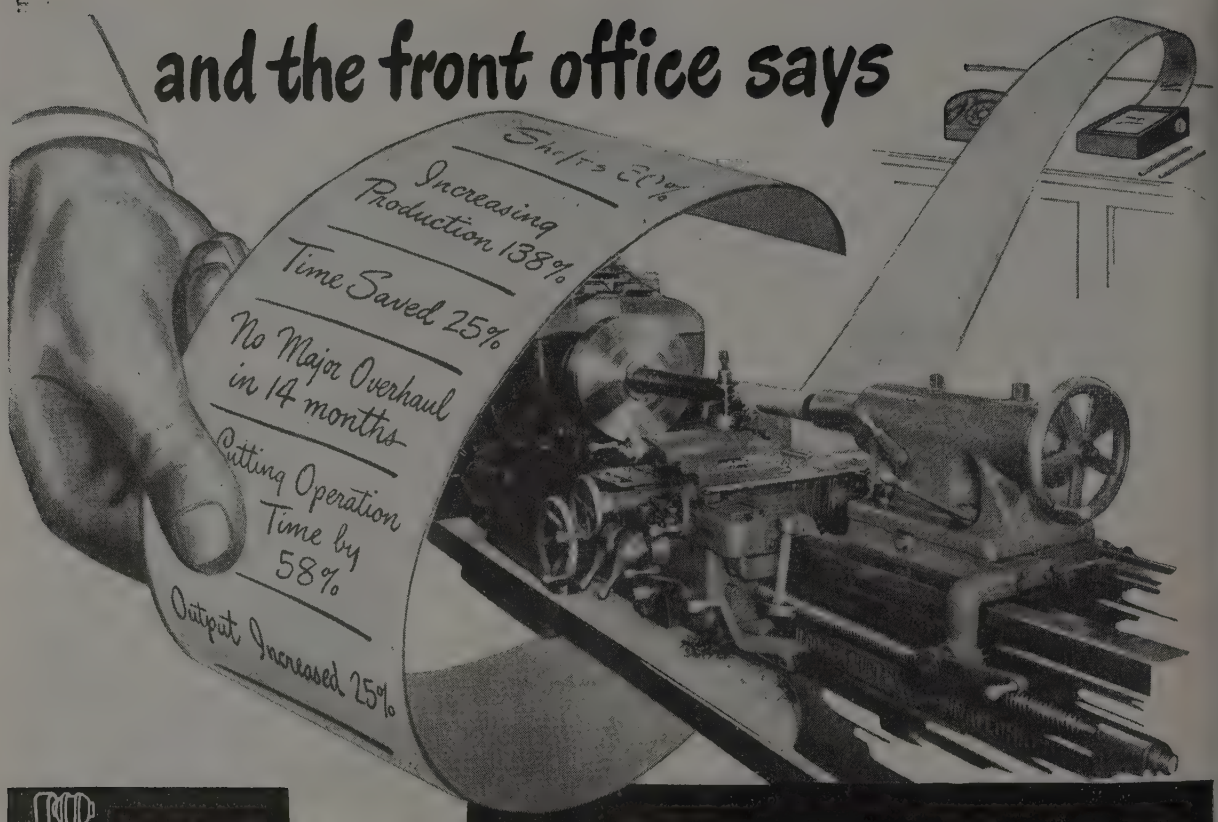
Cities Service means Great Service

CITIES SERVICE

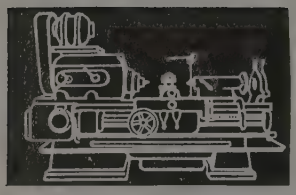
Cities Service Oil Co.
NEW YORK · CHICAGO

Arkansas Fuel Oil Co.
SHREVEPORT, LA.

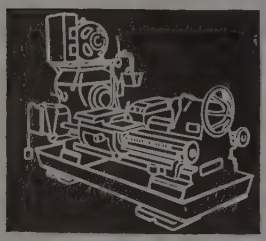
and the front office says


Shifts 2 to 3
Increasing Production 138%
Time Saved 25%
No Major Overhaul in 14 months
Cutting Operation Time by 58%
Output Increased 25%

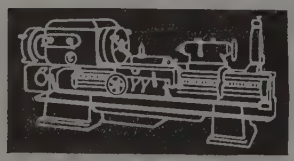
Lodge and Shipley Lathes look *even better* on the Profit Sheet!



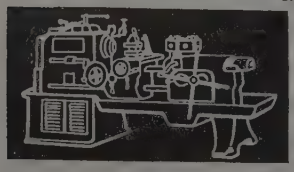
ENGINE, TOOL ROOM AND MANUFACTURING LATHES



2A and 3A DUOMATIC (automatic) LATHES



HOLLOW SPINDLE LATHES



TURRET LATHES

● Just as operators and supervisors approve operating advantages of new Lodge & Shipley Lathes, so top management appreciates their remarkable profit records.

In the front office . . . where production and cost figures get the final going-over . . . you'll find Lodge & Shipley boosters, too!

The records shown in the illustration are authentic, taken from reports of Lodge & Shipley Lathe Owners*. . . indicating the exceptional results obtained in plants of every type and size.

Lodge & Shipley Engineers will be glad to help you check your present lathe production costs against actual comparable costs for the new Lodge & Shipley Lathes . . . show you how to check sharply mounting cost trends. Write for Condensed Catalog showing the complete Lodge & Shipley line.

*Names and additional data on request.

THE Lodge & Shipley COMPANY
CINCINNATI 25, OHIO
MACHINE TOOL DIVISION • 3055 COLERAIN
SPECIAL PRODUCTS DIVISION • 800 EVANS ST.

HOW WE TOOK THE SOCK OUT OF SHOCK!

Another top performance by a BWH product

These huge, prefabricated slabs are the new "face" of a large western dam. Before they're applied, the surfaces must be cleaned with sand. And the entire face of the dam must be chipped and sand blasted in preparation for the new facing slabs. Doing these jobs with old-style sand blast hose often gave the operator an electric shock, sometimes very severe.

The reason is simple: Modern cutting agents and their increased velocities build up static electricity by friction. It accumulates along the interior of the hose tube . . . finally explodes like a miniature bolt of lightning . . . sometimes destroying the usefulness of the hose. But, much worse, it can give the operator a bad jolt.

BWH engineers went to work on this problem. They developed Bull Dog Sand Blast hose, featuring a specially compounded rubber tube stock that carries off most of the static electricity through the tube itself. What's left isn't enough to damage the hose. And the danger of shock to the operator is greatly minimized.

The "shock-absorber" tube of this Bull Dog Sand Blast Hose is wrapped with strong rubberized duck and enclosed in an abrasion-resisting cover. The hose works so well that it has been approved by countless safety engineers. It was used exclusively on this dam refacing job . . . with excellent results.

Bull Dog Sand Blast Hose is just one of the many quality products manufactured by BWH. Whatever your need for industrial rubber goods, look to BWH for dependable ruggedness . . . BWH distributors for dependable service.

★ ★ ★

HAVE YOU A JOB WHERE STAMINA COUNTS?

Bring us your toughest problems . . . we're specialists in solving them. Consult your nearby BWH distributor or write direct.

Another Quality Product of

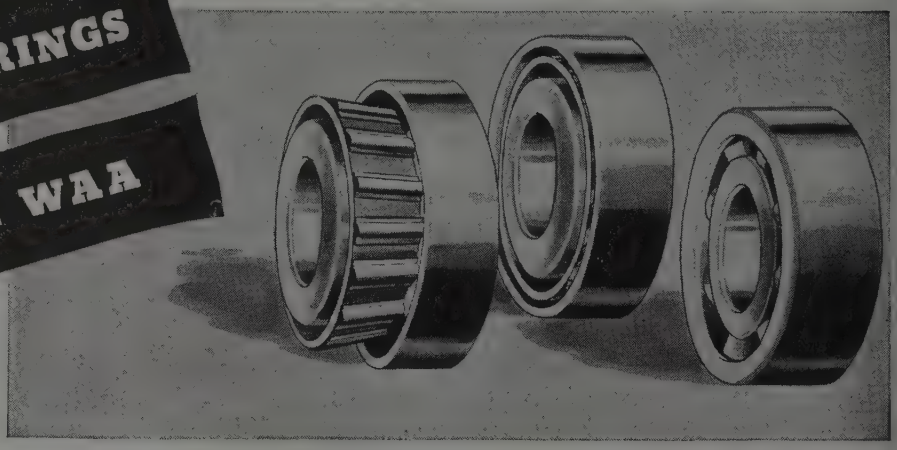
BOSTON WOVEN HOSE & RUBBER COMPANY

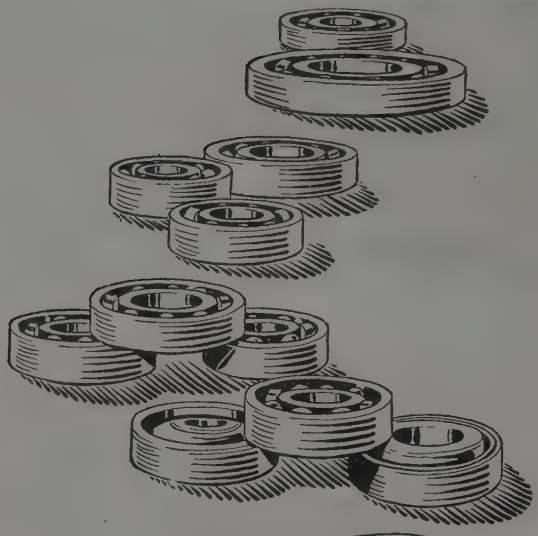
Distributors in All Principal Cities

WORKS: CAMBRIDGE, MASS., U. S. A. • P. O. BOX 1071, BOSTON 3, MASS.

START ROLLING ON BEARINGS FROM WAA

SET YOUR OWN PRICE IN SEALED BID SALES





Get your bearings from the $18,000,000 stock now being sold by WAA. Friction and anti-friction bearings and components in all sizes and types are included in this stock. Many sizes are available in production-run quantities. Set your own price on what you need and submit your bid. Get all pertinent information from your nearest Customer Service Center or WAA Regional Office—go there to make your own inspection.

Sales of bearings will be held at frequent intervals. To receive information on future sales, write, wire or phone the Regional Offices listed below asking that your name be placed on their mailing lists.

CINCINNATI • CHICAGO • ST. LOUIS • DETROIT
KANSAS CITY, MO. • CLEVELAND
LOS ANGELES • NEW YORK

EXPORTERS! Your business is solicited. Much material which is surplus in the United States is urgently needed or is readily salable in other countries. Watch for other offerings, many of them may be of interest to your clients.

OFFICE OF GENERAL DISPOSAL

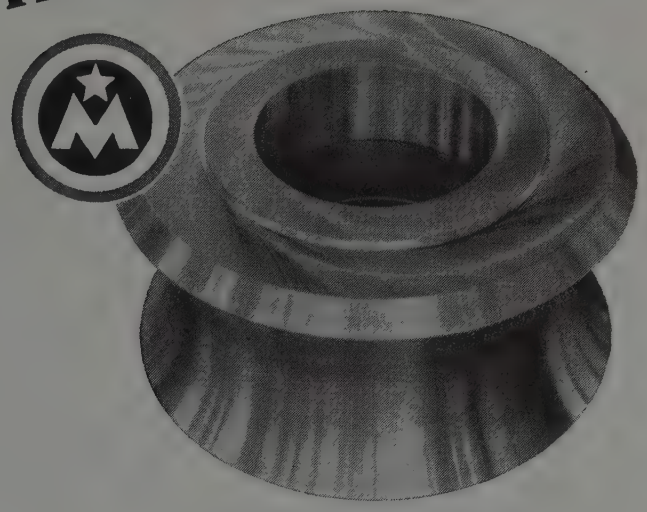
WAR ASSETS ADMINISTRATION

GOVERNMENT WAA SURPLUS

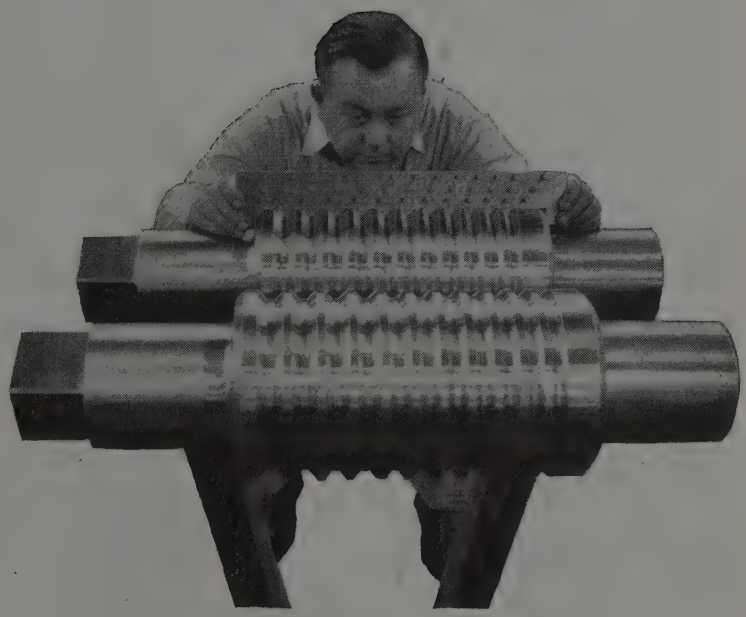
Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago Cincinnati • Cleveland • Denver • Detroit • Grand Prairie, Tex. • Helena • Houston Jacksonville • Kansas City, Mo. • Los Angeles • Louisville • Minneapolis • Nashville New Orleans • New York • Omaha • Philadelphia • Portland, Ore. • Richmond St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Tulsa

1186

YOU CAN BANK ON THESE ROLLS



Rolling sheet or strip . . . steels . . . precious metals . . . copper . . . aluminum? Count on Midvale for the right roll for your purpose, whatever it may be. Midvale hardened and ground forged steel rolls are manufactured to meet the specific requirements of our customers. They're custom-made by men accustomed to problems of analysis, hardness, finish, special grinding, etc.—men who have the best of equipment and unusual skill. Forged rolls are a Midvale specialty. They are worthy of your confidence.



THE MIDVALE COMPANY • NICETOWN • PHILADELPHIA

OFFICES: NEW YORK • CHICAGO • PITTSBURGH
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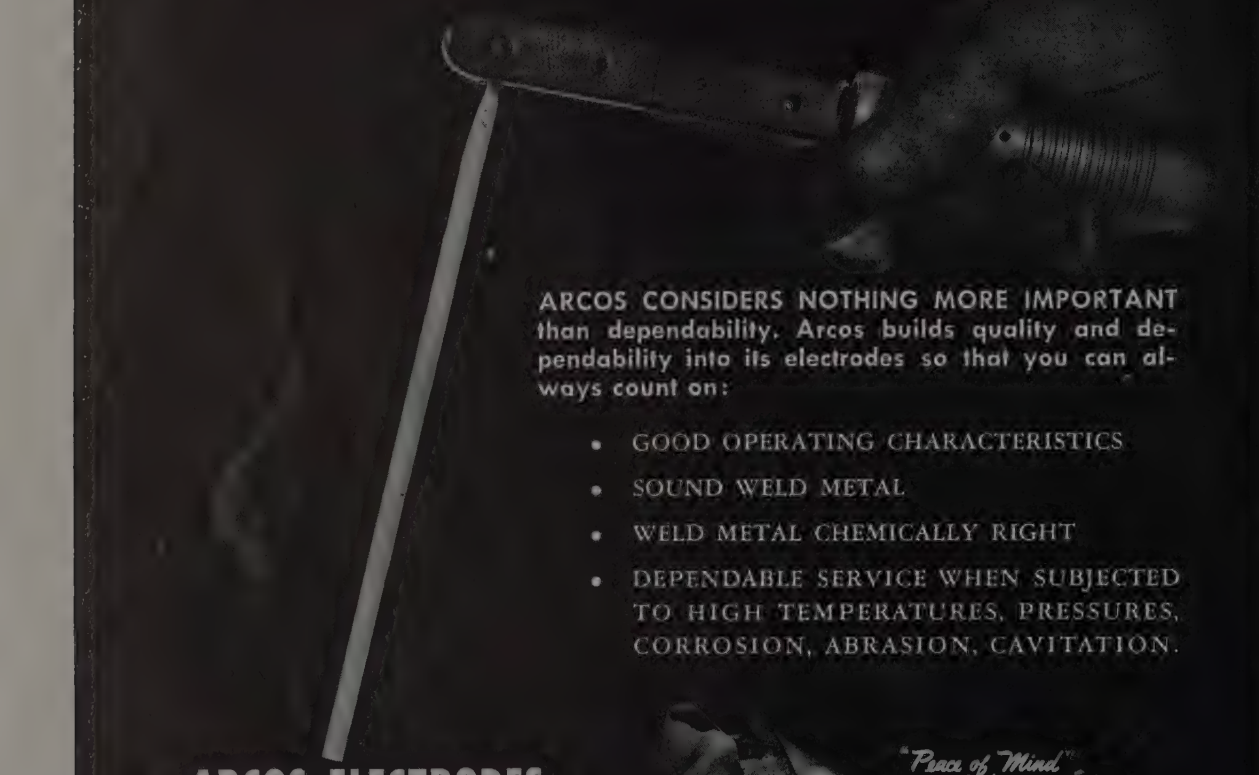
MIDVALE
Custom Steel Makers to Industry

STAINLESS AND TOOL STEEL BARS
•
CORROSION AND HEAT RESISTING CASTINGS
•
FORGINGS AND RINGS

WHAT IS MORE IMPORTANT THAN
DEPENDABILITY
IN THE WELDING OF STAINLESS AND ALLOY STEELS?



ARCOS CONSIDERS NOTHING MORE IMPORTANT than dependability. Arcos builds quality and dependability into its electrodes so that you can always count on:

- GOOD OPERATING CHARACTERISTICS
- SOUND WELD METAL
- WELD METAL CHEMICALLY RIGHT
- DEPENDABLE SERVICE WHEN SUBJECTED TO HIGH TEMPERATURES, PRESSURES, CORROSION, ABRASION, CAVITATION.

ARCOS ELECTRODES

FOR ARC WELDING
ALL STAINLESS STEELS AND ALLOYS

including

Chrome-Nickel and Chromium Stainless Steels

Nickel, Chromium and Manganese High Tensile Steels

Pure Nickel, Bronzes and Monel.

ARCOS

ARCOS CORPORATION • 310 GULF BUILDING, PHILA. 2, PA.

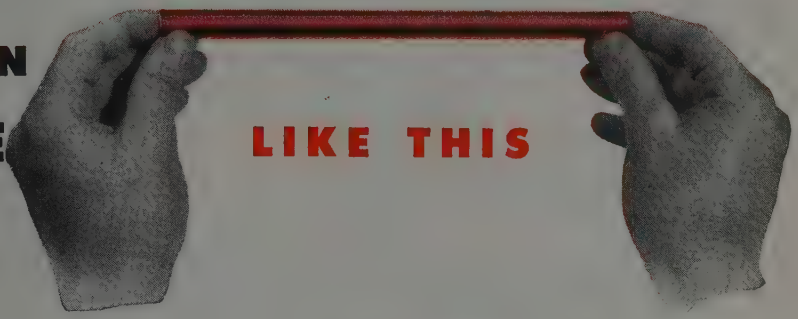
STAINLESS AND ALLOY WELDING ELECTRODES

and OXYARC PROCESS FOR CUTTING METALS

When You Speak of PRIME SURFACE

YOU CAN MEAN

PLAIN TUBE



LIKE THIS

OR ITS EQUIVALENT SURFACE AREA

in

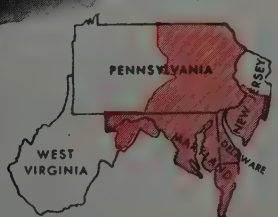
WOLVERINE TRUFIN

LIKE THIS

In heat transfer work, Wolverine Trufin surface is generally considered all prime surface — not secondary surface. In calculating a given heat transfer problem, unknown factors are eliminated — your calculations need not involve intangibles.

WHO'S WHO AMONG WOLVERINE REPRESENTATIVES

J. H. SMITH
128 Commercial Trust Bldg.
15th & Market Sts.,
Philadelphia 2, Penn.



The area he serves embraces eastern Pennsylvania, southern New Jersey, Delaware, Maryland, and eastern West Virginia.

Trufin will deliver a very high rate of BTU's per square foot. Being all-one-piece — the fins extruded from the tube itself — Trufin will withstand vibration and extreme heat changes.

Trufin — THE integral finned tube — will do everything that plain tube will do — and along with that, offers increased surface area. It can be formed and bent as readily as plain tube.

WOLVERINE TUBE DIVISION
CALUMET & HECLA CONSOLIDATED COPPER COMPANY
MANUFACTURERS OF SEAMLESS COPPER & BRASS TUBING
1411 CENTRAL AVENUE • DETROIT 9, MICHIGAN

WHAT'S YOUR QUESTION?...

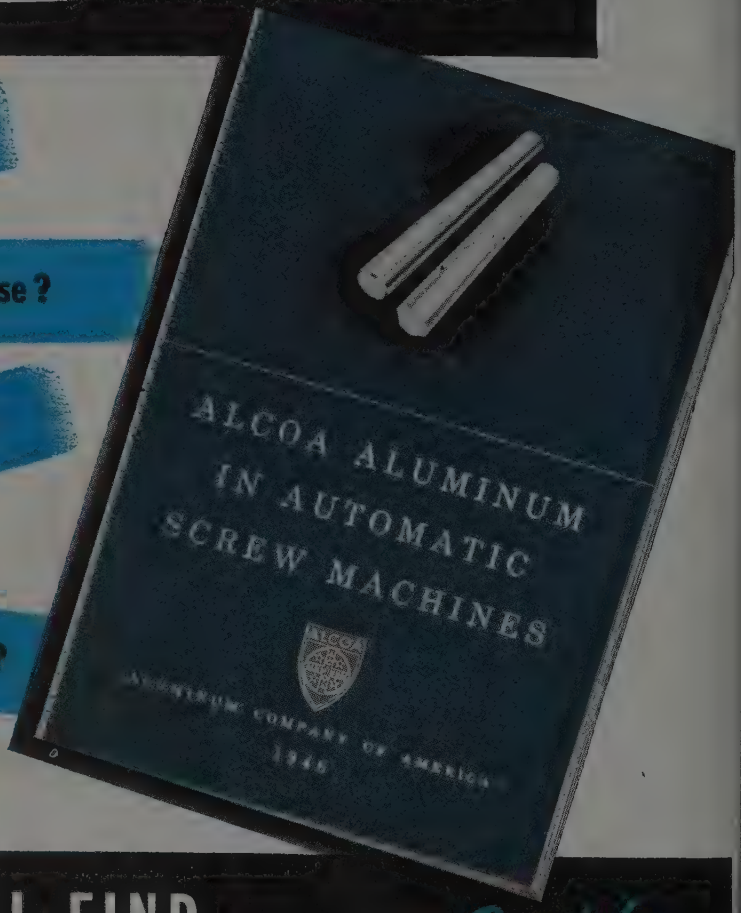
How fast do I feed?

What rake angles do I use?

What about finishes?

What surface speeds do I use?

Can I use carbides?
Are they economical?



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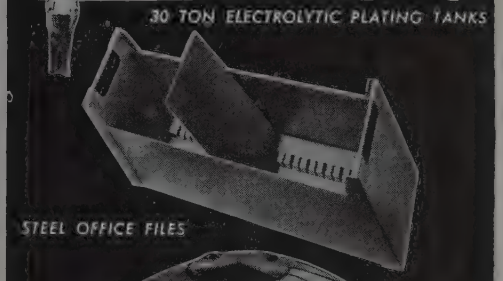

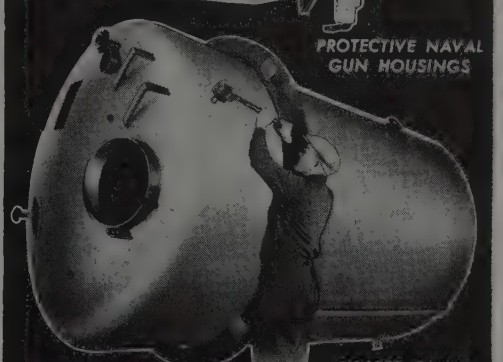

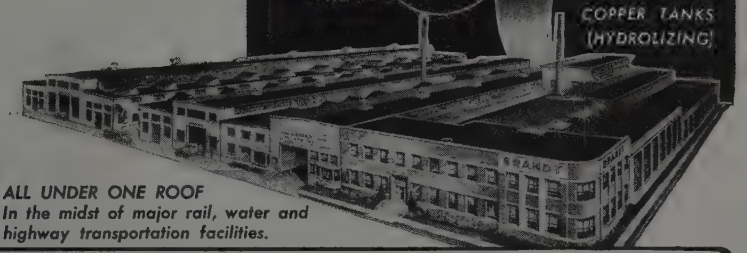

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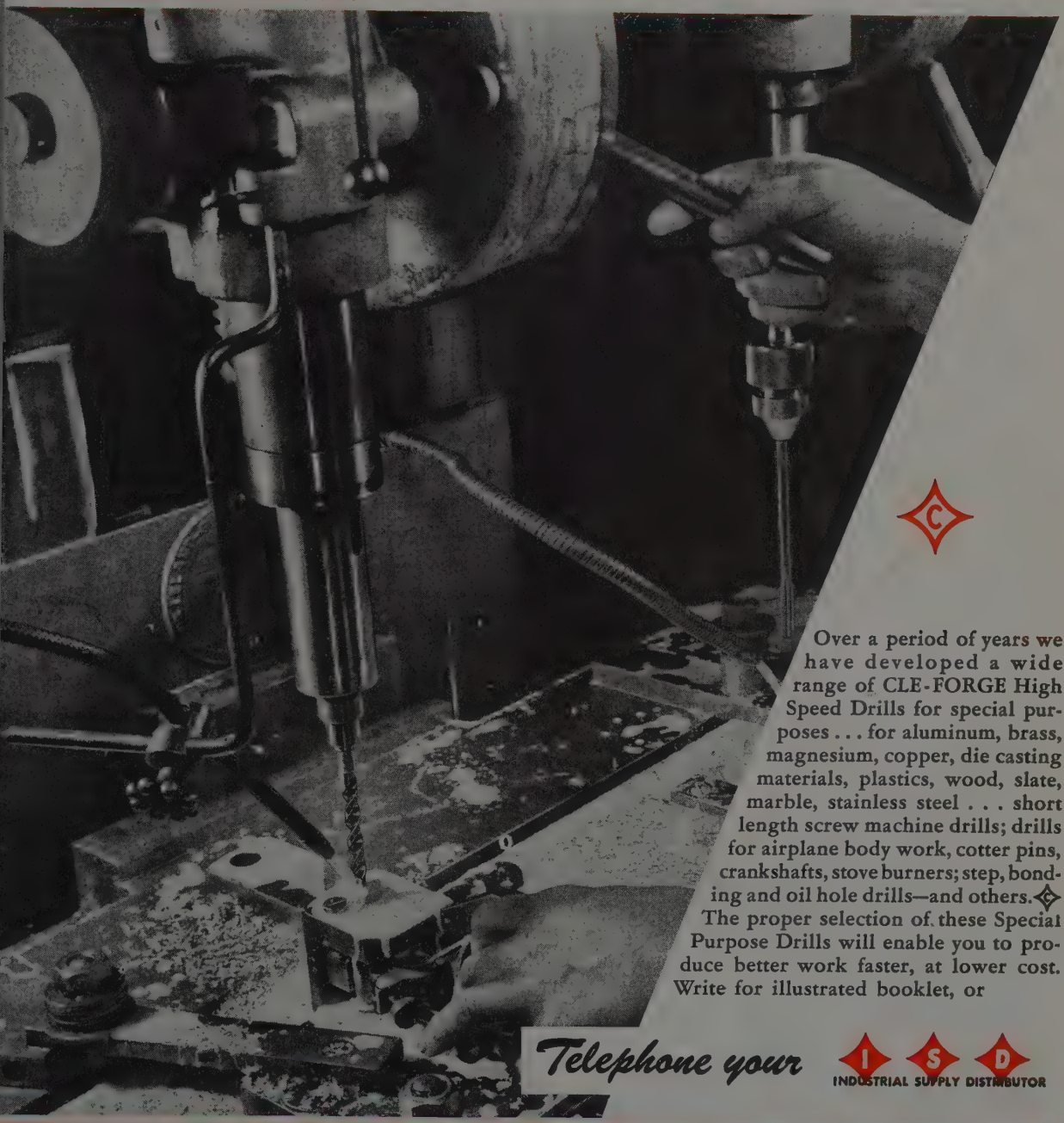

Over a period of years we have developed a wide range of CLE-FORGE High Speed Drills for special purposes . . . for aluminum, brass, magnesium, copper, die casting materials, plastics, wood, slate, marble, stainless steel . . . short length screw machine drills; drills for airplane body work, cotter pins, crankshafts, stove burners; step, bonding and oil hole drills—and others. The proper selection of these Special Purpose Drills will enable you to produce better work faster, at lower cost. Write for illustrated booklet, or

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The most outstanding development in 20 years for machining non-ferrous metals...

The New Warner & Swasey

ACTUAL SHOP EXPERIENCE SHOWS THESE AMAZING RESULTS

THE R. PERLICK BRASS CO., Milwaukee, invested in a new Warner & Swasey Electro-Cycle a few months ago for machining their brass specialties, brewers' fittings and beer dispensing equipment. On the basis of this one machine's outstanding performance, they have since purchased 2 additional Electro-Cycles.

3 New Electro-Cycles Replace 6 Old Turret Lathes

When work that was formerly produced on Cone Head Ram Type Turret Lathes was transferred to new Warner & Swasey Electro-Cycles, greatly increased production showed that the Electro-Cycles would *pay for themselves within 18 months.*

74.9% Production Increase

Twenty-two jobs turned out by the Electro-Cycle showed an average increased output of nearly 75%. This average covers the machining of at least 22,000 parts in large and small lots—from runs of 10,000 down to 100 pieces.

Tool Breakage Cut 15%

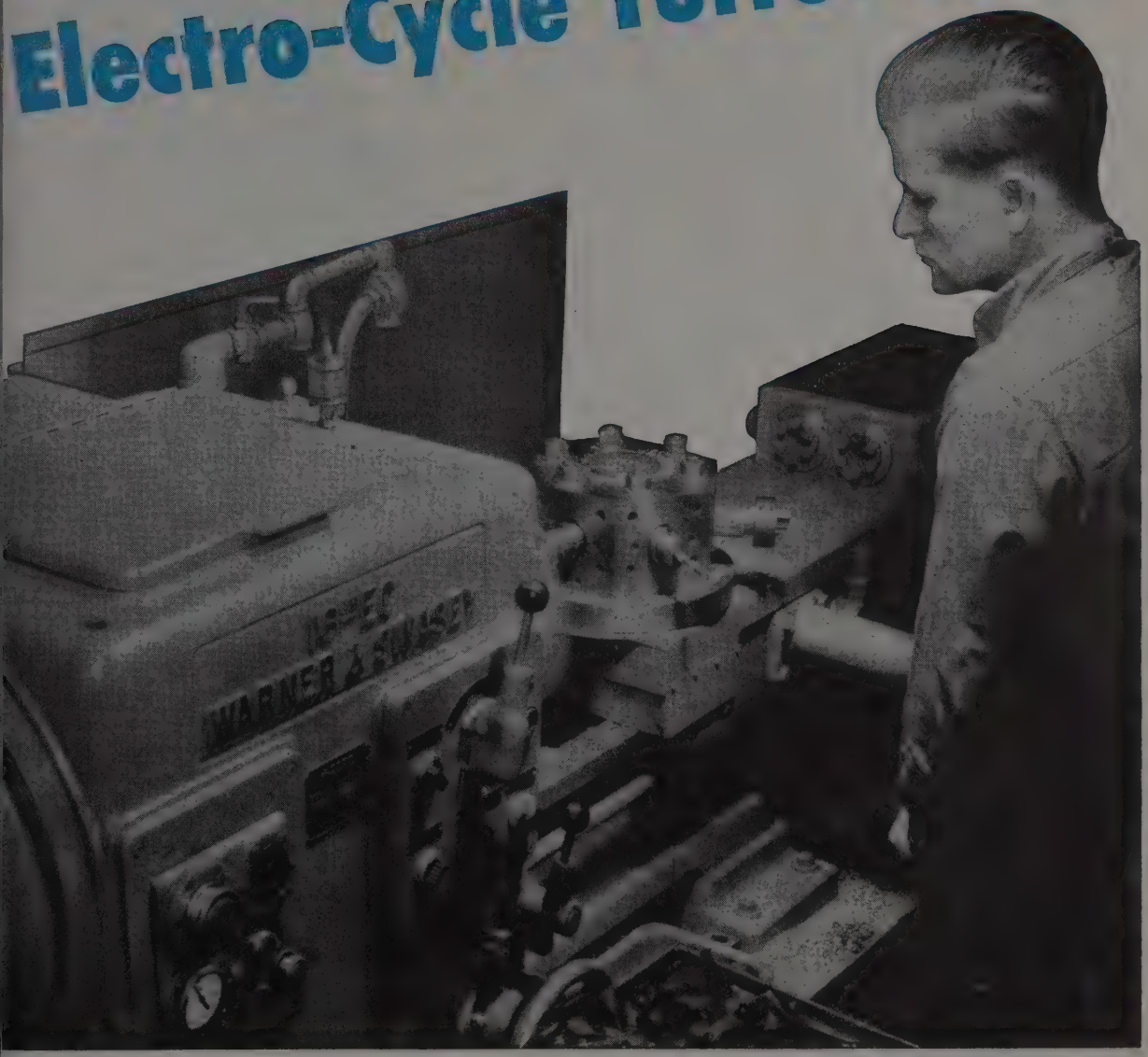
No new tools or chuck jaws were needed in effecting these production increases. Tools were simply transferred from old turret lathes to the new Electro-Cycles without need for adjustments. Sharp reductions in tool breakage, together with easier maintenance now result in a minimum of down-time in this shop.

Operators Report 50% Less Fatigue

The Electro-Cycle's completely AUTOMATIC SPINDLE CONTROL means less effort for the operator. These employees of the R. Perlick Brass Company say work fag has been cut at least 50% by their Electro-Cycles. Controls are so simple, even inexperienced men soon become capable and efficient operators.

TURRET LATHES. MULTIPLE SPINDLE AUTOMATICS. PRECISION TAPPING AND THREADING MACHINES

Electro-Cycle Turret Lathe



Here's Why the New Electro-Cycle Means Bigger Profits in Non-Ferrous Metal Turning

COMPLETELY AUTOMATIC SPINDLE CONTROL, exclusive with the new Warner & Swasey Electro-Cycle, results in less machine tool handling time —increases production with a minimum of scrap loss and tool breakage.

Push buttons preselect spindle start and stop, spindle reverse, and speed changes for any turret position. Manual operation of the headstock is eliminated. A wide variety of jobs formerly difficult and costly, can now be machined quickly and easily.

WARNER & SWASEY
Machine Tools
Cleveland

You Can Machine it Better, Faster, for Less... with a Warner & Swasey

SPEED UP

those clean-up jobs

with a Thor

Model 7B with push throttle. Also available with button or lever throttles.

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WELD FLUX SCALING HAMMER

This power-packed Thor Hammer saves time and money on many jobs. Use it for fast, low-cost removal of flux after welding, chipping, chiseling, scaling, etc. Its got plenty of speed and power for quick, better results. Air blast keeps work surface visible by blowing away chips, scale and dirt. *Ask your nearest Thor branch to arrange a demonstration.*

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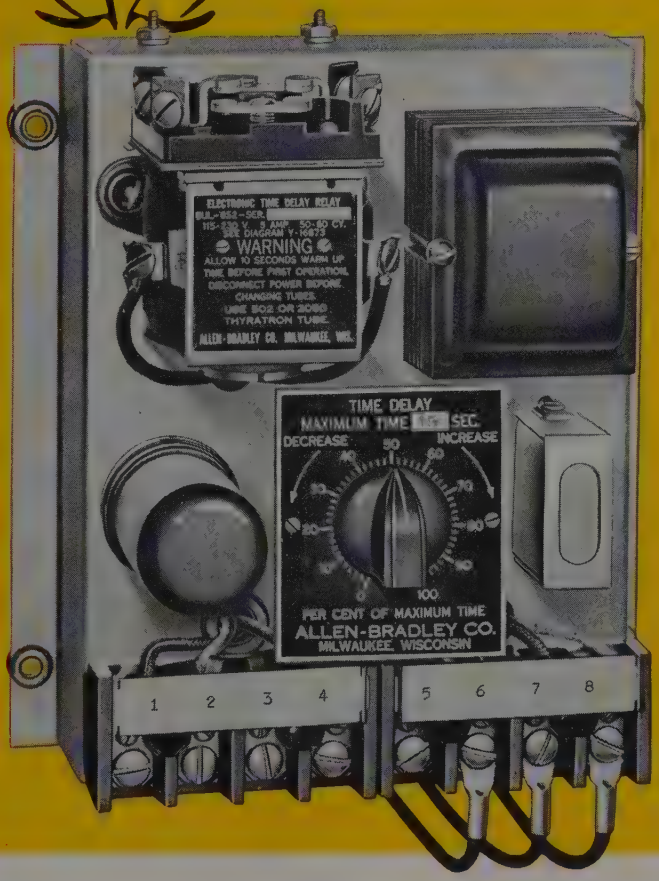
New Bulletin #852

ELECTRONIC TIMING RELAY



A Rugged Timer that Provides Accuracy under Frequent Service

This new Allen-Bradley electronic timing relay is designed primarily for machine tool and other applications where an accurate timer is required for frequent service. It has a range of 20 to 1, and is provided in eight timing ranges, with from one-half second up to two minutes maximum time delay. The reset time is approximately 1/10 of the maximum time delay.

The new Bulletin 852 A.C. Timing Relay possesses a high degree of flexibility. It can be recycled rapidly over long periods without affecting its performance in any way. The relay can be furnished with two normally open contacts, two normally closed contacts, or with one normally open contact and one normally closed contact. Write for complete information, Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.

RELIABLE—Timing is always consistent because the operation of this relay is electronically controlled and does not depend upon any mechanical action.

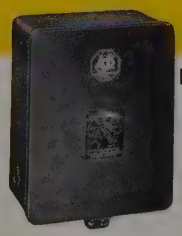
EASY ADJUSTMENT—Timing is adjusted by a simple turn of a knob to the desired calibration. The relay will always reset to this adjustment.

UNAFFECTED BY VOLTAGE—Line voltage changes of 10% or less have no effect on the timing operation.

REMOTE ADJUSTMENT—Timing control potentiometer and dial may be removed as a unit and mounted separately for control from a distance.

INDUSTRIAL RELAY—A rugged A-B industrial type solenoid relay is used for switching, eliminating a common source of electronic timing relay trouble.

VIBRATION-PROOF—The chassis has rubber mountings which isolate the relay from vibration and shock.



ENCLOSED VIEW

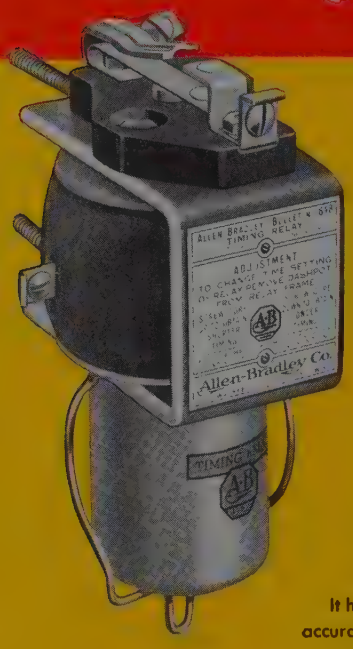
Also for REMOTE ADJUSTMENTS

A-B Quality

ALLEN-BRADLEY

MOTOR CONTROL

THREE OTHER RELIABLE ALLEN-BRADLEY TIMING RELAYS



Bulletin 848
FLUID DASHPOT TIMING RELAY

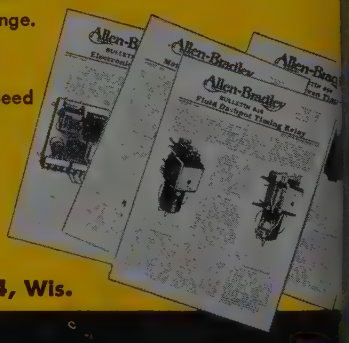
This magnetic type relay is simple, dependable in operation, and inexpensive. It can be used in many applications where reliability is more important than exactness of timing. With the new dashpot fluid used in this relay, operation at ambient temperatures from + 120F to —30F is possible without undue variations in timing. Has an adjustable range from 2 to 20 seconds. Available for a-c or d-c, in single-pole construction with either normally open or normally closed contacts.

Bulletin 849
PNEUMATIC TIMING RELAY

This solenoid type timing relay utilizes an adjustable pneumatic dashpot for controlling the tripping time. It has a range of from 1/6 second to 180 seconds and an accuracy of approximately ± 10%. While it has neither the accuracy nor the long timing range of a motor-driven timer, it is extremely reliable, and will give unusually good performance in timing most production cycles and similar machine tool applications. The relay is designed for 25 to 60 cycle operation, and has a single-pole, double throw switch.

Bulletin 850
MOTOR-DRIVEN TIMING RELAY

Designed for timing comparatively long intervals with a high degree of accuracy. Can be furnished in several ranges with maximum time delays of from 1 to 15 minutes. Variations in time between successive operations are less than 1% of the full scale range. For a-c pilot control service only. The single-pole switch can be connected for normally closed or normally open operation. Provides excellent service where high speed recycling is not required.



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Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.

A-B Quality

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Now . . . prompt deliveries on U·S·S Carilloy Steels

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YOUR alloy steel requirements are best served by our stocks of constructional AISI alloy steels readily available from our warehouses. U·S·S Carilloy Steels are manufactured to a ***Guaranteed Minimum Hardenability.*** Charts are furnished with each shipment to you as your guide and assurance of this ***Guaranteed Minimum Hardenability.***

Moreover, when you place an order for U·S·S Carilloy Steel, our metallurgical service goes a step further: *We send you data with each individual shipment showing complete and specific information about the steel you receive.* This specific data on its composition, potential physical properties and fabrication will guide you in obtaining maximum performance from the steel furnished on your order.

Take advantage of all this information in supplying your alloy steel requirements. Use U·S·S Carilloy Steels from our large stocks.

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Perhaps these exclusive advantages of graphite are the practical solution to some of your steelmaking and foundry problems. The International technical staff will be glad to assist you in adapting this versatile material to your operations. International supplies graphite in blocks, tubes and slabs, or machined to your blueprint specifications.

Other International Graphite Products

Electrodes—for electrothermic and electrolytic purposes

Rods—for open, blind, and semi-blind risers

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Want Tighter Control Over Parts Cost?...

A BULLETIN SERVICE

for users of forgings, entitled "Advantages Obtained by Utilizing Champion Forging Techniques", gives complete information about cost reductions and quality control achieved by forging specific parts in closed impression dies.

. . . Buy Forgings . . .

Close Tolerance Forgings Produced by

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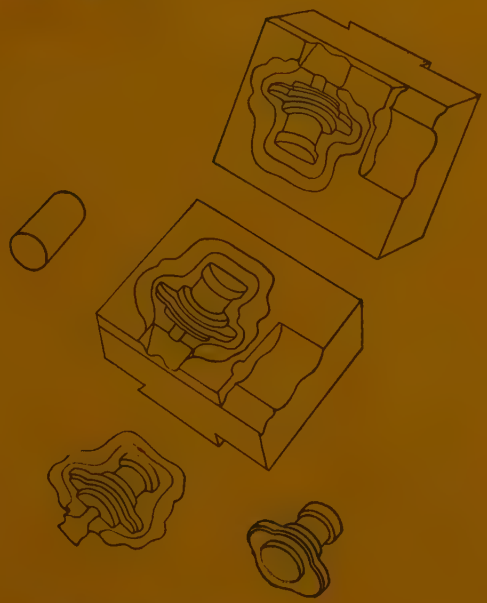
FORGING TECHNIQUES

● Tighter control over the cost of parts begins with engineering and design and involves every handling and production operation, including the final machining or finishing. The scope of Champion Forging Techniques likewise comprehends every step and stage of production clear through to the end use or application of a part. Thus, forgings produced by Champion Forging Techniques may present to you opportunities, which are often unappreciated or overlooked, to obtain and maintain a tighter control over end-use cost. For instance, in the production of a certain part, a slight change in design, unimportant in the function of the part but of major importance in forging the metal to form it, was recommended, resulting in notable reductions in the cost of jigs and tools and machining and finishing. Ask a Champion Forging Techniques Engineer about tighter control over the cost of parts weighing from a few ounces to over 1300 lbs.



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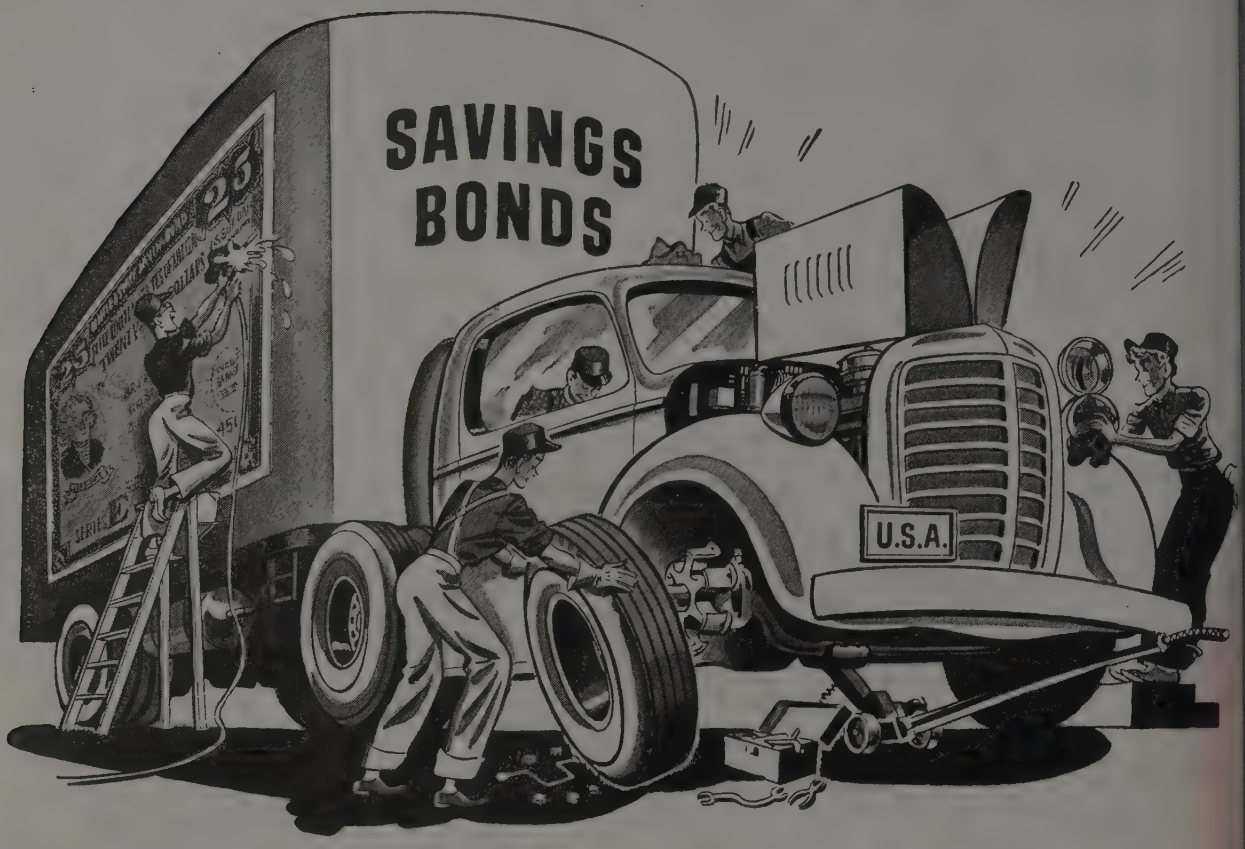
Time for a **Spring Check-up . . .**



on the plan that delivers Peace of Mind

THANKS to the work of patriotic volunteers, the U. S. Savings Bonds program has carried America a long way up the road to economic security.

During 1946, in spite of all the problems and uncertainties the nation faced, sales of Savings Bonds *exceeded redemptions* by $1,389,216,000. The success of this great sales operation has helped stem the tide of inflation, has reduced public debt holdings of the banking system, and has given millions of citizens a stake in their country and a profitable investment in their own futures.

Yes, we've come a long way—but the trip isn't over! Now is the time to check up on your Payroll Savings Plan. Make sure that all your new employees are familiar with its advantages. Remind *all* your employees that there's no easier, surer way to build their own futures—and America's—than by buying Bonds regularly through the Payroll Savings Plan. Every $3 invested pays $4 at maturity!

For any help you need in conducting the Payroll Plan, call on your State Director of the Treasury Department's Savings Bonds Division.

New Savings Bonds Plan won't affect the P.S.P.

SOON the Treasury Department and the banks of America will make it possible for farmers, doctors, and other self-employed people to participate in "automatic" Bond buying by special arrangement with their banks. This extension of the Savings Bonds program is not a partial payment plan and is intended *only* for people who are not in a position to take advantage of the Payroll Savings Plan.

The Treasury Department acknowledges with appreciation the publication of this message by

STEEL

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

CHICAGO DAILY NEWS, Tuesday, March 25, 1947. ★★★ 27

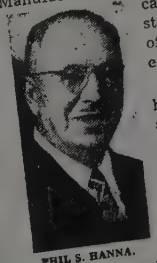
EVERYBODY'S BUSINESS

Rivals Help Firm Get Back on Feet After Fire

BY PHIL S. HANNA.

Those who say there isn't any sentiment in business might consider what sentiment did to help a burned out West Side manufacturer hold his trade and quickly get back into production.

About 4:30 a.m. on Monday, March 3, the Accurate Spring Manufacturing Co., at 3811 W. Lake st., had a real fire. It was called a total loss. The brick walls were left standing but that was about all. All records and office equipment were destroyed with the exception of those in the vault.



PHIL S. HANNA.

The president of the company, F. D. Weber, happened to be in Florida but the vice-president and general manager, A. A. Bonde, was quickly on the job.

* * *

BY NOON OF THE DAY of the fire, with the help of the Illinois Bell Telephone Co. and the Graemere Hotel, five trunk lines were operating at the hotel on the company's regular telephone number. Bonde and his aids were contacting customers all over the country.

Within a few hours after the fire five competitors in Chicago had volunteered to produce springs for the Accurate company. Some offered to use Accurate personnel to give the company full opportunity to meet the particular needs of its customers.

The Galter Manufacturing Co., 711 W. Lake st., one of Accurate's customers and a manufacturer of cameras and lighters, turned over floor space to Accurate for rebuilding tools and permitted Accurate personnel to use its tool-making machinery. Another manufacturer offered the use of brand-new machines.

* * *

A MEETING OF THE Chicago Association of Spring Manufacturers was called to help Accurate get back into production for it was realized how seriously the fire had endangered the close production schedules of the automobile industry, a big user of springs.

On Monday, March 10, seven days after the fire, the Accurate company set up temporary headquarters in a plant at 1474 W. Hubbard st., leased from the Nu-Tone, Inc., manufacturers of chimes. Nu-Tone was moving and Accurate took over an unexpired lease, a number of punch presses and tool room equipment.

On the 10th day after the fire contracts were placed with L. J. Graf Construction Co. to rebuild the factory at 3811 W. Lake st.

* * *

MORE THAN 150 EMPLOYEES had been called back to work. The company's branch plant at Fowler, Indiana, was doing double duty.

"Call us on our new telephone, MONroe 1145," says a letter from President Weber to his customers under date of March 12 (nine days after the fire). "It is likely we can take care of your requirements beginning April 10."

"Why all this co-operation?" I asked of a man who knows the background. "Oh," he replied, "Weber put in 15 years building good will among customers, his competitors and his own employees—and when he got into trouble everybody wanted to help him. It's a Chicago habit, I believe."

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Inc., the $10 par comm
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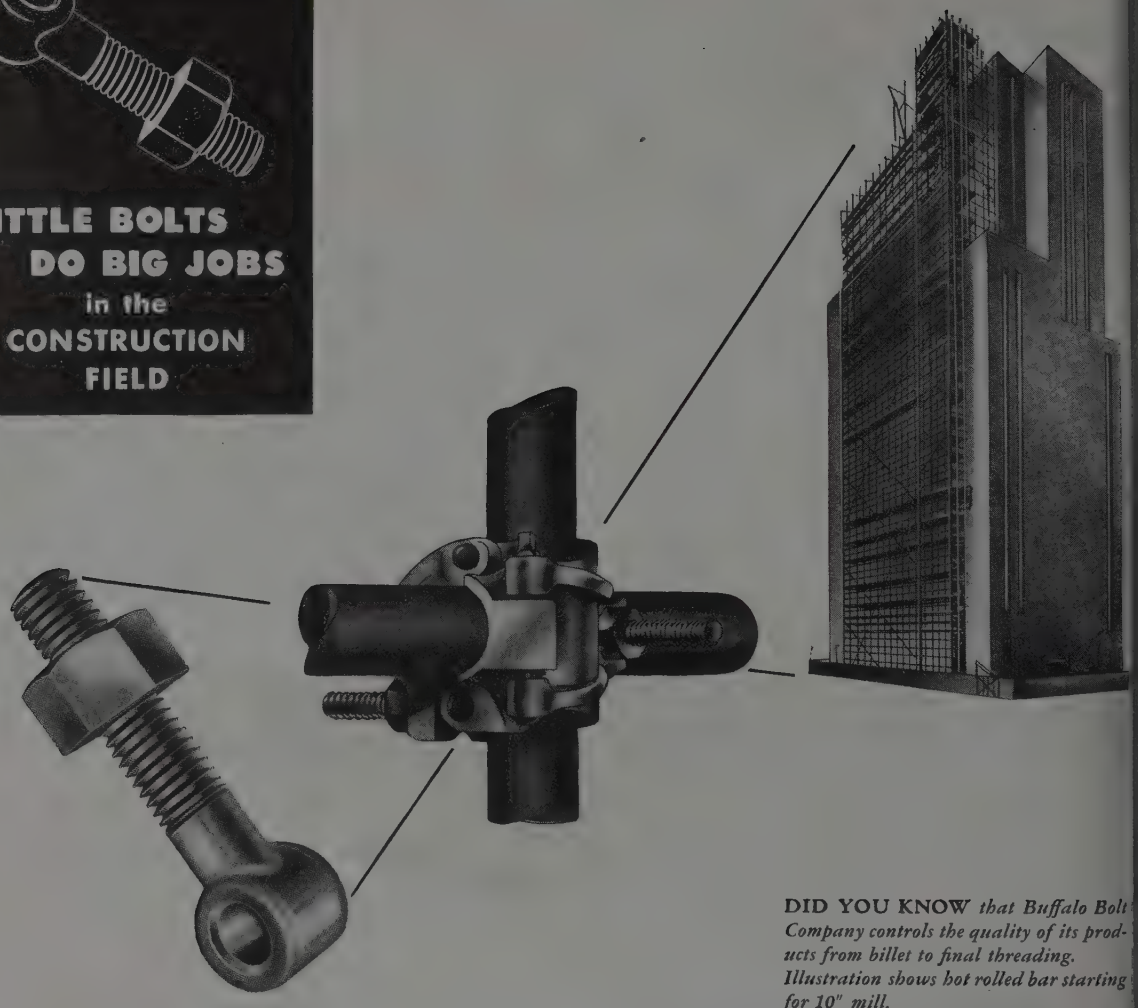
WE would like to use this means to thank those whose cooperation made possible our prompt resumption of production following the fire which destroyed our main plant. We are again able to quote on all types of precision springs and wire forms, and in many cases can promise favorable delivery schedules. When you need springs we will welcome the opportunity to discuss your requirements with you.

ACCURATE SPRING MFG. CO.
1474 W. HUBBARD STREET (Temporary)
CHICAGO 22, ILLINOIS

Accurate Springs

Send for a copy of the Accurate "Handbook of Technical Data on Springs" which contains valuable data on design formulation and load deflection.

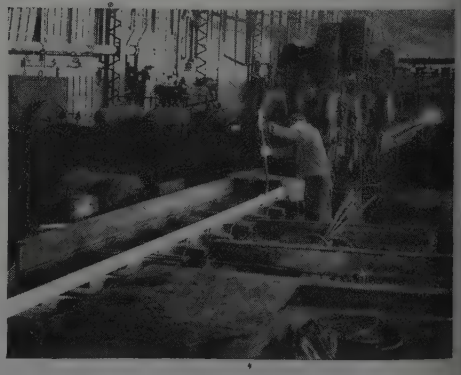
LITTLE BOLTS DO BIG JOBS in the **CONSTRUCTION FIELD**



DID YOU KNOW *that Buffalo Bolt Company controls the quality of its products from billet to final threading. Illustration shows hot rolled bar starting for 10" mill.*

● Modern scaffolding makes it possible to erect or renovate large structures with unbelievable speed, efficiency and safety . . . an accomplishment in which small fasteners play a highly important part. For it is upon the strength and reliability of fasteners such as the special Circle Ⓑ Bolt illustrated that the ultimate utility of the scaffolding depends.

Circle Ⓑ Fasteners have a long-standing reputation throughout industry for dependability . . . for uniform size and strength. That's why you will find Circle Ⓑ Bolts and Nuts . . . standard and special . . . used so extensively on such a wide variety of well-known products.



Ⓑ BUFFALO BOLT COMPANY

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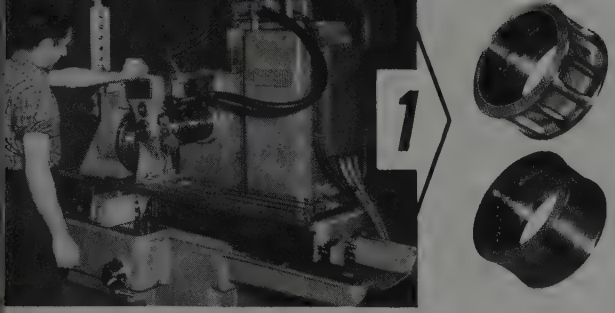
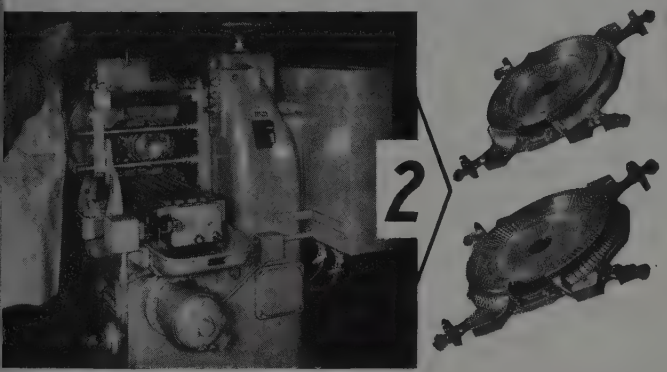
Export Sales Office: Buffalo International Corp., 50 Church Street, New York City

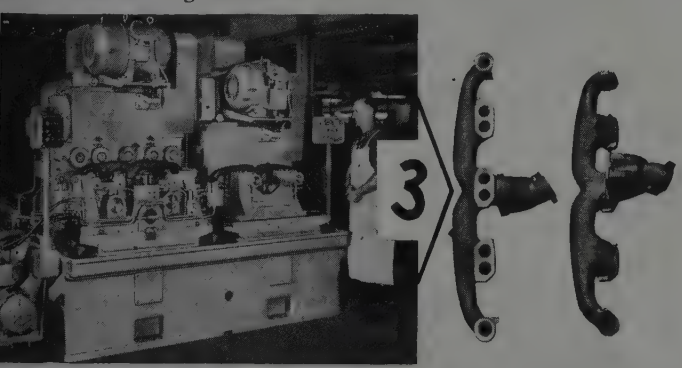
How SUNDSTRAND "Engineered Production" Improves Milling Methods



Machine Time Cut from 3 Hours to 8 Minutes With STANDARD RIGIDMIL This completely automatic Rigidmil is standard, including the vertical feed attachment. Loading and unloading the workpiece and starting the machine cycle constitutes the operator's duties. The 12 grooves in the pump cylinder block sleeve were formerly machined in 3 hours. The Sundstrand Rigidmil automatically machines the 12 grooves at the rate of 7½ pieces per hour. In addition, compared to the previous method of machining, the operator's duties are greatly simplified.



SUNDSTRAND RIGIDMIL With Special Head Mills 84 slots in One Setting This Standard Rigidmil has been provided with a special 2 spindle horizontal head. In addition, a special Sundstrand automatic index base is mounted to the machine table. The work holding fixture mounted to the automatic index base holds one part. The part has 84 slots — 42 in upper half and 42 in lower half. In using the automatic index in conjunction with an automatic machine cycle, all 84 slots are milled automatically with only one handling of the work piece. The cut is of the "plunge" type. Consequently the machine is equipped with a positive stop and dwell attachment so that the length of feed stroke (depth of cut) is held within limits of —.001". Three different sizes of parts are machined on this Rigidmil.



SPECIAL RIGIDMIL Mills 11 Surfaces in 2 Settings The shape of the part together with production requirements called for a special machine to mill these manifolds. Operations include rough and finish milling port faces and back facing washer seats on port flanges. The special Sundstrand Twinplex Rigidmil has a ten spindle head on left hand column, for rough and finish milling the five port faces — the six spindle head on the right hand column mills the seats on the port flanges. The mainfold is transferred from left to right with the operator loading at one station while a part is being machined in the adjoining station. The fixture at the left hand station is automatically retracted on the return stroke of the head so that the cutters do not drag over finished milled surface.

■ Profitable milling production can be obtained only by lowering *unit* production costs . . . obtaining the most economical solution to your milling problem and the most productive milling equipment in relation to your production requirements.

Basically, there are two approcahes to solving these problems, (1) obtaining standard machines, then trying to process parts over these machines as economically as possible, (2) designing the most profitable processing method, then obtaining machines to suit this method — standard or semi-standard machines, if possible, or entirely special machines, if necessary.

This latter method is Sundstrand "Engineered production" . . . the most practical approach to economical milling. The following is a brief resume of the complete engineering and manufacturing service available from Sundstrand to meet all or any of your production milling requirements in small and medium size work.

These actual examples are presented to reveal one of each of the methods used in solving milling production problems. One of these methods may be the solution to your present problem.

FREE ADDITIONAL DATA Write for more proof of the successful application of Sundstrand "Engineered" milling production. Our Booklet entitled "Practical Milling Methods" contains over 60 problem solutions complete with tooling diagrams. Ask for Bulletin 761.

SUNDSTRAND MACHINE TOOL CO. ROCKFORD, ILLINOIS, U.S.A.

SUNDSTRAND MACHINE TOOL COMPANY

2540 Eleventh St. • Rockford, Ill., U.S.A.

RIGIDMILS • AUTOMATIC LATHES • SPECIAL MILLING AND TURNING MACHINES

CLECO PNEUMATIC TOOLS

to be manufactured by

THE REED ROLLER BIT COMPANY

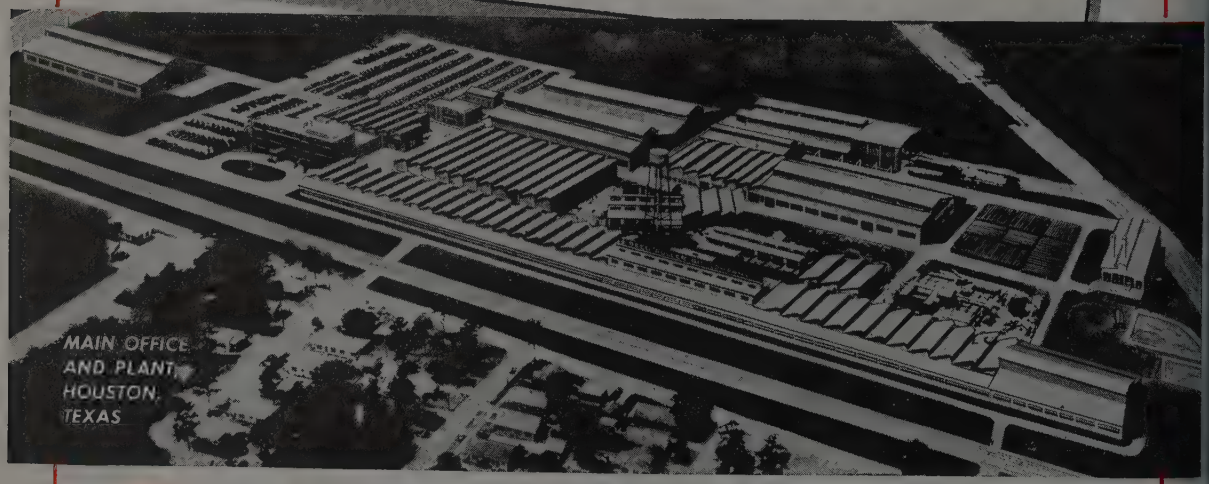
of HOUSTON, TEXAS

THE REED ROLLER BIT COMPANY, of Houston, Texas, announces the purchase from the Cleveland Pneumatic Tool Company, of inventory and manufacturing rights of CLECO PNEUMATIC TOOLS.

Production of these tools will be continued in Houston, Texas.

Organized in 1919, the Reed Roller Bit Company is one of the largest manufacturers of Rotary Drilling Tools in the world. This quarter of a century of experience in the manufacture of tools for the exacting oil industry is your assurance that CLECO PNEUMATIC TOOLS will continue to be the leaders in the field.

You can be assured of the traditional Reed Service . . . prompt, dependable, efficient. Send us your inquiries.



Cleco **PNEUMATIC TOOL DIVISION**
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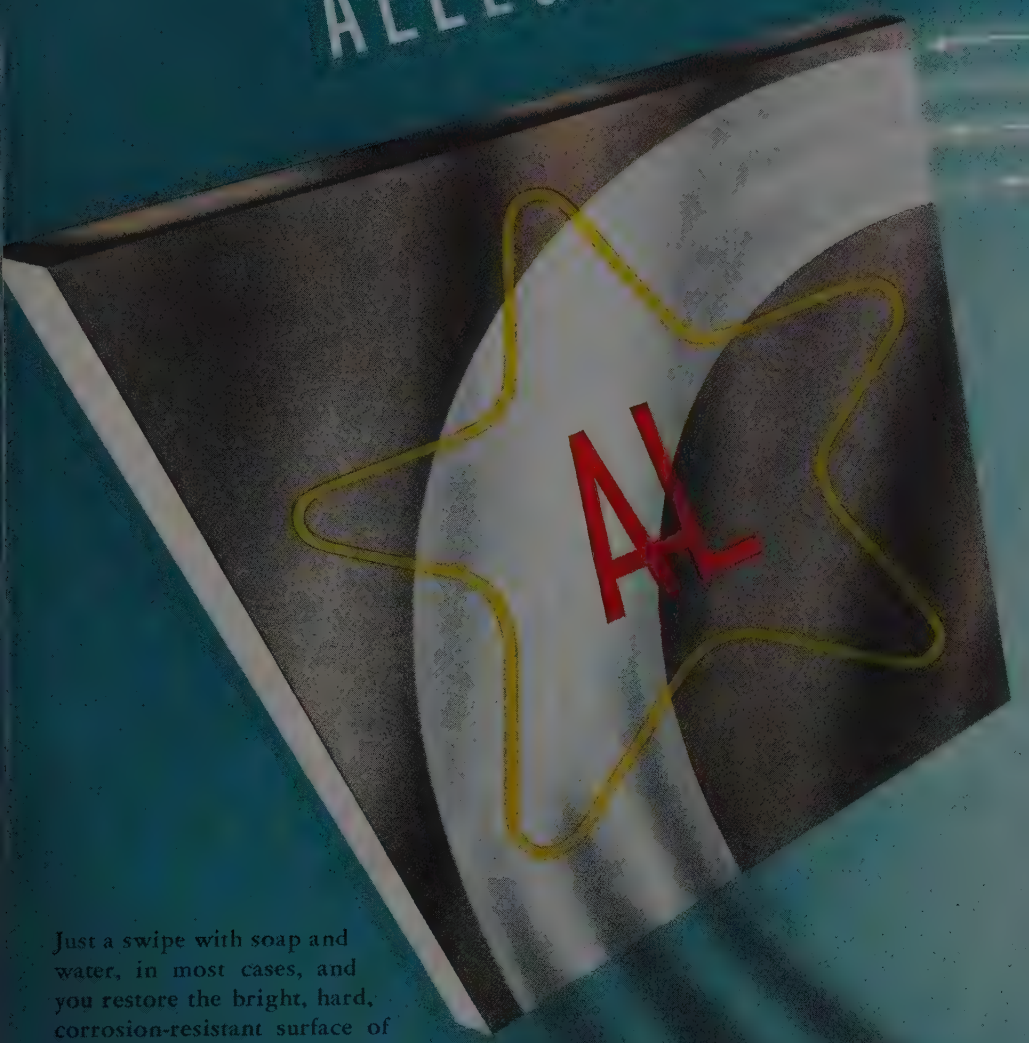
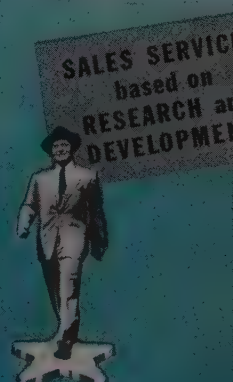
Manufacturers of the CLECO Line of Pneumatic Tools for Modern Industry

for the lowest cleaning costs

ALLEGHENY METAL



Just a swipe with soap and water, in most cases, and you restore the bright, hard, corrosion-resistant surface of Allegheny Metal to its original luster. There's very little muss or fuss—hard rubbing or scouring is seldom required—and ordinary chemical sterilizers, when needed for sanitary reasons, have no effect on Allegheny Metal. In short, you just can't match stainless steel for easy and inexpensive cleaning, and long life. What's more—with production increasing, you'll soon be able to get all the Allegheny Metal you want. ● Let us help you now to plan ahead.



ALLEGHENY LUDLUM STEEL CORPORATION, PITTSBURGH 22, PA.

Pioneer in Specialloy Steels

CALL FOR AN ALLEGHENY LUDLUM ENGINEER

ALLEGHENY METAL is stocked by all JOS. T. RYERSON & SON, Inc., Warehouses

He pulls production DOWN!

INADEQUATE WIRING, the industrial jinx, upsets the best of calculations—the most thorough planning.

Production quotas are a fiction, the most modern machines are inefficient, the best of workmen are frustrated when overtaxed, over-extended obsolete wiring can pull down plant efficiency 25 percent* or more.

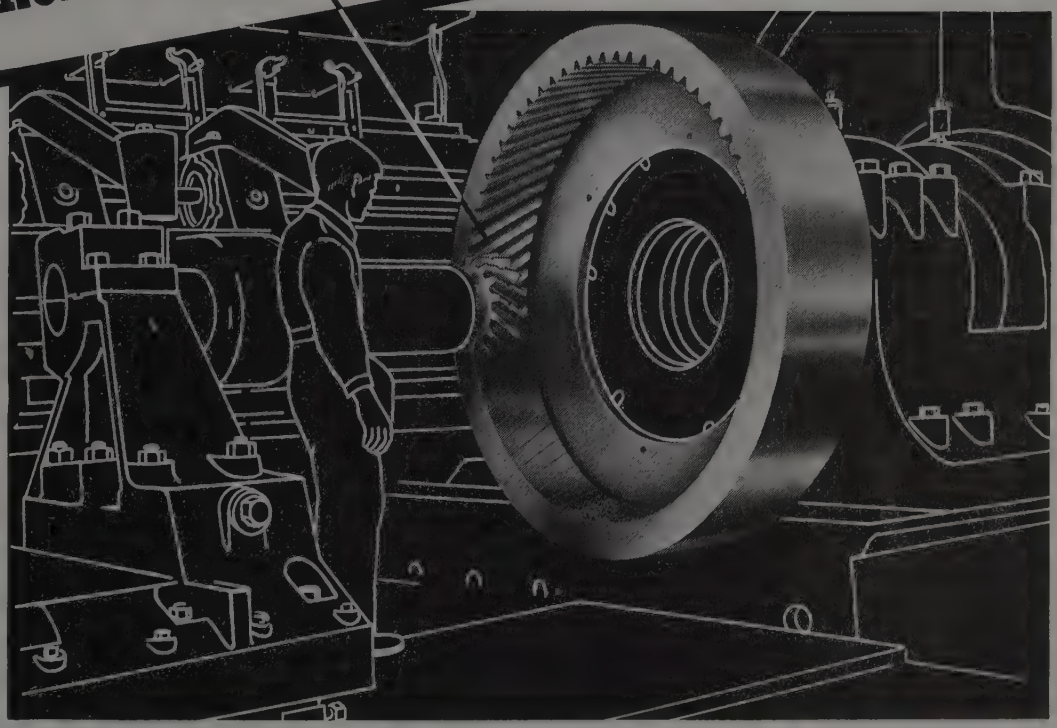
To get the production curve up, ask your plant power engineer, your consulting engineer, electrical contractor or utility power salesman to put this demon *out*. Action now may save shutdowns and costly alterations later.

*WIRE AHEAD, a new booklet discussing preventive maintenance . . . the symptoms of inadequate wiring . . . and presenting plans for anticipating electrical demand, is now in preparation. We shall be glad to send it on request as soon as it is available. Address our Advertising Department, 25 Broadway, New York 4, N.Y.

ANACONDA
from mine to consumer

ANACONDA WIRE AND CABLE COMPANY

Here's where Farrel INTERNAL GEARS inherit precision



The precision in Farrel internal gears is passed on from the machine on which these gears are made — the Farrel-Sykes Gear Generator.

The initial precision built into this Farrel machine plus the inherent accuracy of its operating principle—"precision generation"—gives the gears accurate tooth contour and tooth spacing. Because of this you can be sure that when you buy internal gears from Farrel, they will operate smoothly, quietly and efficiently over a long service life.

Precision generated internal gears with either spur or single helical teeth are available in any size up to approximately 16-feet diameter, 12-inch face, 1¼ DP.

Internal gears frequently meet design and operating conditions better than other types and their availability in large sizes has extended their advantages to many applications where size limitations formerly prevented their use.

Next time you need internal gears or gear engineering help call on Farrel.

FARREL-BIRMINGHAM COMPANY, INC.

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FARREL The Gear with a Backbone

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STRENGTH AND POWER!

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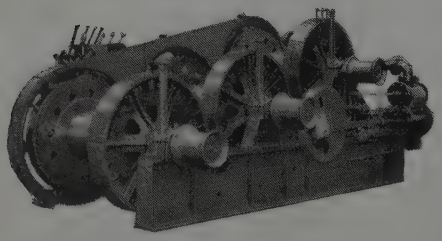

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BLOCKS and SHEAVES
CROSBY CLIPS

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In hoists, the name "American" is an accepted guarantee of excellence. And it's a name that insures the *right* hoist for any job. All types, all sizes, from small general purpose hoists to huge heavy-duty steam, electric or diesel models, are available.

In derricks, the facilities and engineering experience of this organization are unmatched.

Let us help you find the combination of derrick strength and hoist power "made to order" for your needs.

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REDUCES Sulphide Segregation

INCREASES Ingot Yield

Thorough tests prove that the ladle addition of FERROCARBO-S reduces segregations in high sulphur machining steel. Higher ingot yields are thereby effected.

The FERROCARBO-S addition is particularly effective in breaking up sulphide segregations that usually occur near the top of the ingot. The handicaps of resulphurized steel are thereby overcome.

In open hearth and electric furnace steels, too, FERROCARBO-S provides phenomenal reduction of stringers in ingots and forgings. Increased yields and improved physical properties are regularly proving its reliability and consistency of action.

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Model 478 with low-high contacts in ranges of 0-800°F., I.C.; 0-1100°F., I.C.; 0-1600°F., I.C.; 0-1600°F., 25H; 0-2100°F., 25H; 0-2500°F., 25H; and 0-3000°F., 27. 115v, 60c.

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Model 431 in ranges of 0-400°F., I.C.; 0-1000°F., I.C.; 0-1600°F., I.C.; 0-1600°F., Chromel-Alumel (25H); 0-2000°F., 25H; and 0-2500°F., 25H. 115v, 60c.

INDICATING ELECTRONIC PYROMETER CONTROLLERS

Model E486 in ranges of 0-1100°F., I.C.; 0-1600°F., I.C.; 0-2500°F., 25H; and 0-3000°F., 27. 115v, 60c.

RECORDING PYROMASTER PYROMETER CONTROLLERS

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Model 431-20 with low-open-high or low-normal-high contacts. Range 0-1200°F., 25H. 115v, 60c.

Model 431-20 with low-open-high or low-normal-high contacts. Range 0-2000°F., 25H. 115v, 60c.

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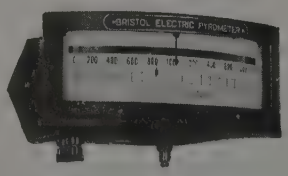

Model 420 in ranges of 0-800°F., I. C.; 0-1600°F., I.C.; 0-2100°F., 25H; 0-2500°F., 25H; and 0-3000°F., 27.

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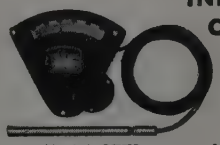
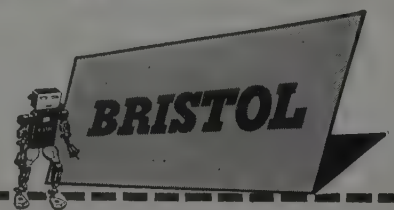


INDICATING TEMPERATURE CONTROLLERS (THERMOMETER TYPE)

Model 377B, range 100-600°F., 5, 10 or 15 feet tubing, plain copper bulb 10¼ in. long and 2 ft. flexible extension.

Model 377B, range 100-800°F., 10 or 20 feet tubing, plain steel bulb 10¼ in. long and 2 ft. flexible extension.

Model 377B, range 200-1000°F., 10 feet tubing plain steel bulb in cast iron socket for solder, tin, lead, and babbitt pots. All 115 and 230 v. 60c.



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Such Preference Must Be Merited

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IRON ORE PIG IRON COAL COKE

SUBTRACTED SECONDS add up to dollars saved

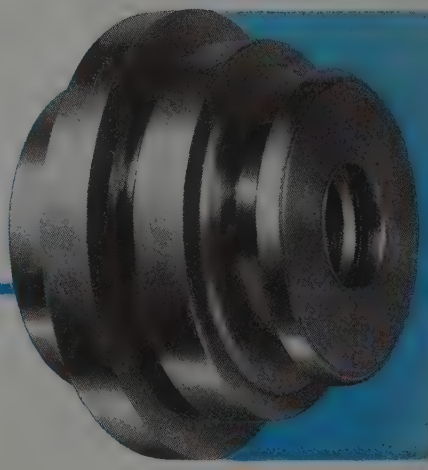
Machine time is just about the only factor in total production cost that is flexible enough to change.

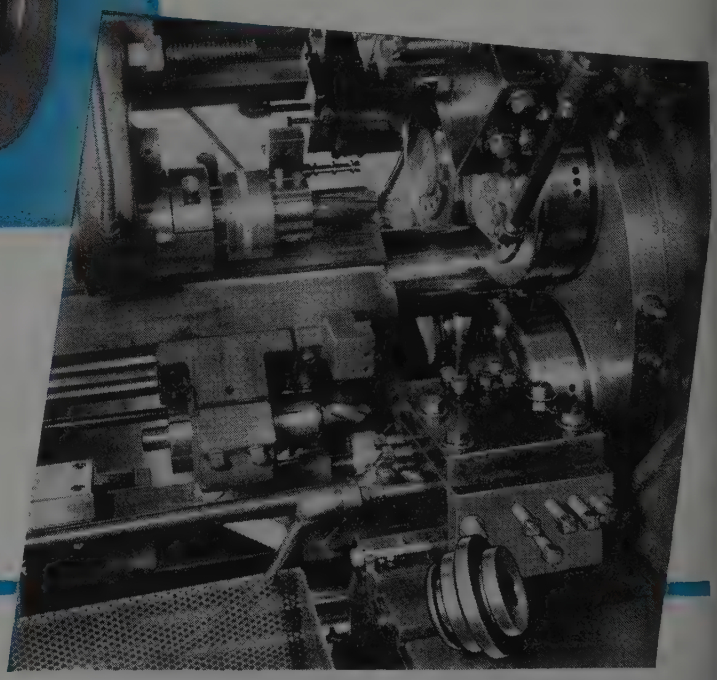
Raw materials cost you just what they cost your competitors. Hourly wage rates are commonly established on an industry-wide base.

But reduce by a second, or even a fraction of a second, the machine time required for producing a long-run part, and you have something that shows up on your cost sheet.

Acme-Gridley modern production methods are helping many a plant keep costs down by saving seconds in production cycles.

We'll gladly give you more details.





Typical Time Saving

This gear blank, 4" x 2¾", is turned from low carbon, hot rolled steel bar stock on a 5", 4-spindle Acme-Gridley Bar Automatic.
11 operations are required—machine time 2½ minutes—25 parts produced per hour.
Machine removes metal equal in weight to finished part. Requires unusual rigidity for heavy duty turning, boring and forming. Accelerated reaming and internal grooving operations included.

ACME-GRIDLEY BAR and CHUCKING AUTOMATICS
Maintain accuracy at the highest spindle speeds and fastest feeds modern cutting tools can withstand.

THE NATIONAL ACME COMPANY

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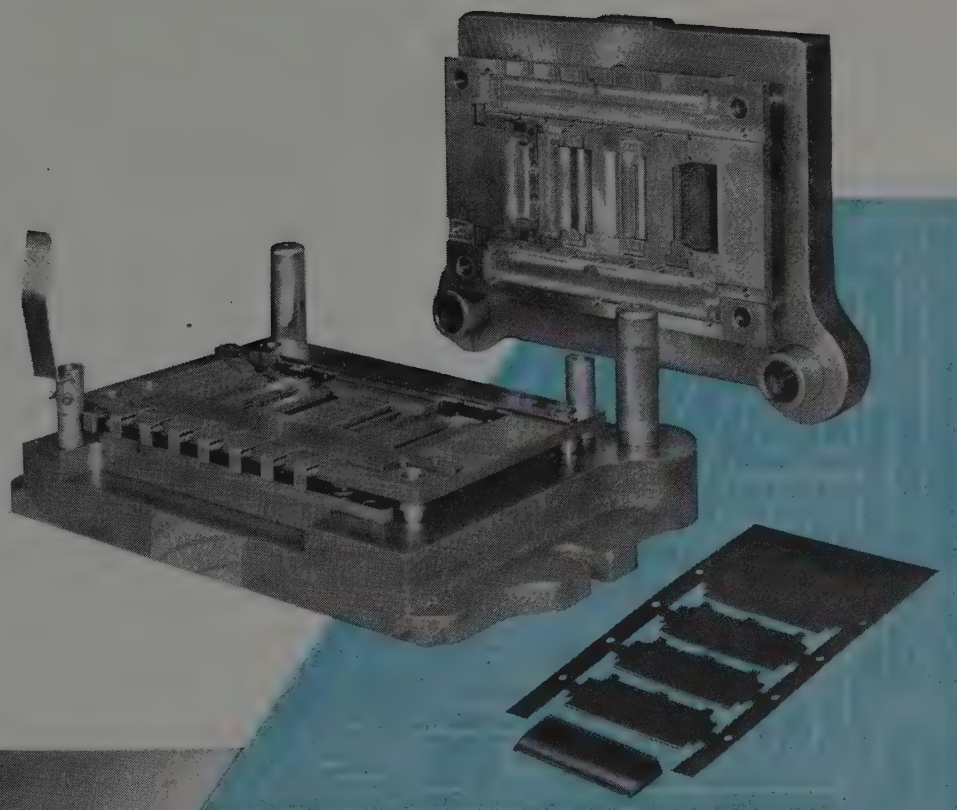

Blueprints to happy tunes . . .
with the right dies

Atlas "precisioneering" produces thousands more harmonica stampings with minimum maintenance

A stamping is no better than the dies which produced it. That's exactly what a manufacturer of well-known harmonicas proved on his production line.

It was Atlas "precisioneering"—the scientific application of engineering, skilled craftsmanship and Nth degree accuracy—that made this possible.

As shown in the above illustrations an Atlas precision-produced, progressive die turns out harmonica parts quickly, economically and in greater numbers. This die has been engineered to emboss the name on the steel blank . . . stamp out the development contours . . . form the interlocking lips . . . give the final forming touches . . . and then automatically eject the piece from the die.

Whatever your problem in metal stamping or tool and die design take advantage of "Atlas Precisioneering." Our help starts before the blueprint and ends with the finished product. Let our staff of 250 skilled engineers, designers and tool makers prove "a load off your shoulders onto ours" may be your answer to increased production and lower costs. Write . . .

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TOOLS AND DIES
JIGS AND FIXTURES
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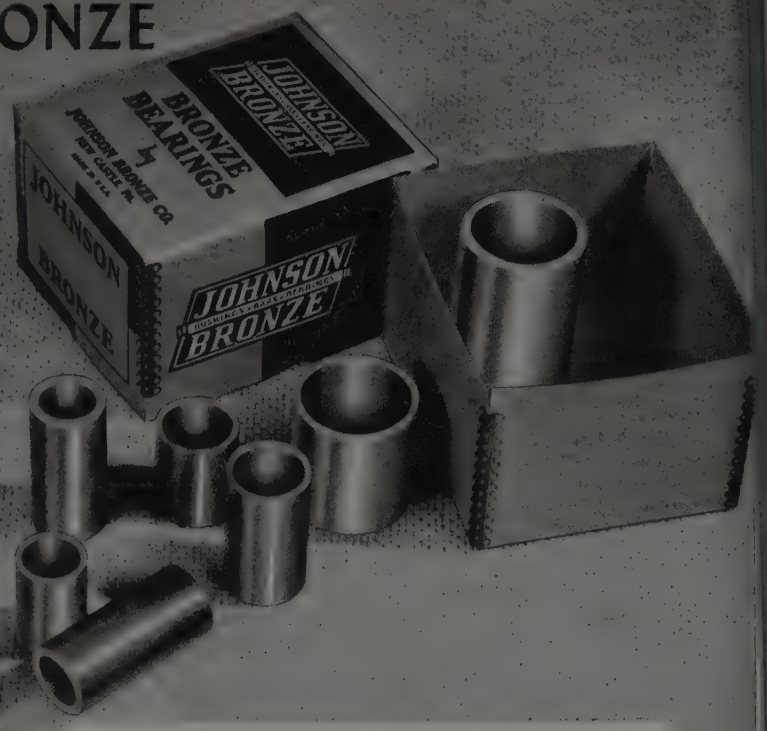
GENERAL PURPOSE BEARINGS



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Quick Delivery

● Delays in securing replacement parts are expensive luxuries. Idle men and machines because of breakdowns are items few companies can afford. When it's bronze bearings you need there is no excuse for waiting. Simply call your local Johnson Bronze warehouse or your local Johnson Bronze Distributor.

Be sure to specify Johnson G. P. Bearings. From our list of over 850 Standard Stock sizes you can buy exactly according to your needs. Every bearing is completely machined, ready for immediate installation. Alterations such as oil holes, grooves or slots are easily, economically added.

The next time you need cast bronze bearings compare your required sizes with our complete stock list. Give us the opportunity to prove our excellent service. The bearings will prove their quality through performance.

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The MOST COMPLETE SLEEVE BEARING SERVICE in the WORLD

550 S. MILL STREET NEW CASTLE, PA.

Here are actual experiences of users of ANTISEP:

IN MICHIGAN:

In centerless grinding of carburized transmission shafts, ANTISEP at 80 to 1 produced a finish of 7 micro inches, beating 13 obtained with former oil. Pieces between wheel dressings increased from 125 to 180. Parts did not rust after grinding.

IN NEW JERSEY:

A bearing manufacturer had complaints on skin troubles. He put ANTISEP in his grinders (100-1 mix) and found within a few weeks that skin irritations had ceased and that machines were clean and free from rancid odors.

IN CALIFORNIA:

ANTISEP was evaluated against two other oils, and was found not only to produce superior finish, but also to eliminate blueing of the metal. An 80-1 ANTISEP mixture beat a 25-1 dilution of the other oils.

IN NEW YORK:

ANTISEP was adopted because it eliminated that "Monday Morning" odor in the shop. Gumming was stopped, machines were clean, and over 11 months there was no rust problem on ground work, even at a 100-1 dilution.

IN ILLINOIS:

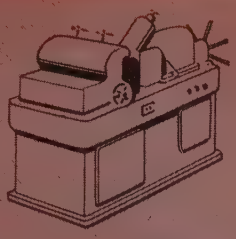
A shop used to dress its grinding wheels every 20 pieces; using ANTISEP, it produces 50 pieces between dressings. Operators like the clean, antiseptic odor.

IN OHIO:

From 4 to 6 broaches per wheel was ANTISEP'S improvement in one shop. Wheels stay clean longer, do not burn the work.

•

Plenty more if we had space. To get the whole story, ask the Houghton Man!



If your machine tools could talk . . .

"Listen, boss, I need a spring tonic," they might well say. "For years you've kept me on a diet of soluble cutting oils which have clogged up my system.

"I've got B. O. I'm dirty inside and out. The men who make me work don't like my rancid odor. They complain about 'blued' or burned parts. They claim their skin is irritated by those oils you feed me to cool the work.

"How about a change of oil diet?"

•

Those machines would brighten up if they had Antisep Soluble Oil in their reservoirs. Here is a new idea in water-soluble cutting oils, capable of greater dilution, and possessing cleansing and sterility features which today rank in importance with tool life and fine finish. Antisep is exclusive with E. F. Houghton & Co., Philadelphia and all principal cities. Try it . . . test it . . . use it!

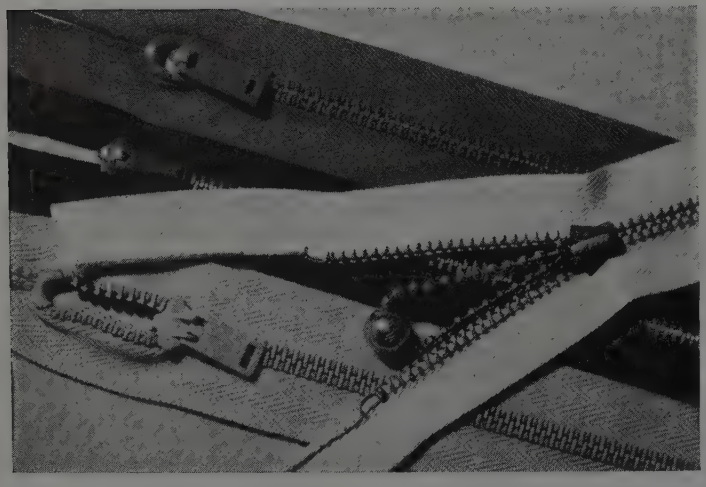
HOUGHTON'S

ANTISEP

SOLUBLE OILS

SEYMOUR NICKEL SILVER

ON THIRTY MILLION HANDBAGS??



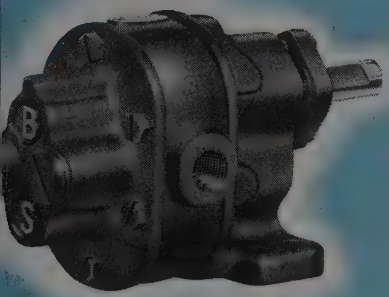
The exact number of zippered handbags in use is far more than one to a family; add purses, luggage, clothing, covers and industrial equipment and the number reaches astronomical dimensions — just "millions and millions" is close enough! Most zippers (or slide fasteners) are made of nonferrous alloys — and a very important percent of the total output is made of Seymour Nickel Silver. This alloy of copper, nickel and zinc is preferred for these ingenious fasteners because of its exceeding toughness and strength, controllable ductility, corrosion resistance, and fine, silvery white color.

THE SEYMOUR MANUFACTURING COMPANY, SEYMOUR, CONN., U.S.A.

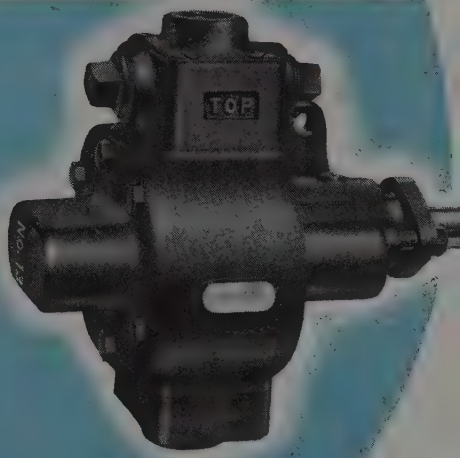
NONFERROUS ALLOYS SINCE 1878

Motor-Driven Centrifugal Pumps for coolant supply

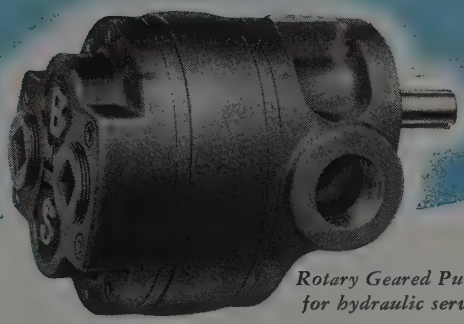
Pumps that back up your design



Rotary Geared Pumps for general purposes



Rotary Geared Pumps Reversible Type for general purposes



Rotary Geared Pumps for hydraulic service

YOU'VE MADE SURE of everything about your machine design . . . including lubrication, coolant supply and hydraulic service. Now make sure that the pumps you specify back up your design—specify Brown & Sharpe Pumps.

Everything about these pumps . . . design, materials and manufacturing . . . is the result of long experience in fulfilling the pump requirements for machine tools and other machine equipment. The aim of Brown & Sharpe in making this complete line of pumps is to provide the correct type of service, a completely dependable service and an enduring service for every pumping need.

Write for pump catalog which gives detailed specifications on the complete line of Rotary Geared, Vane, Centrifugal and Motor Driven Pumps. Brown & Sharpe Mfg. Co., Providence 1, R. I., U.S.A.

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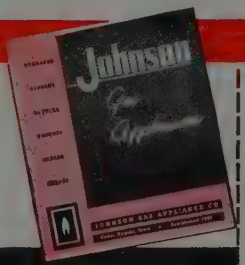

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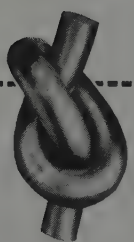

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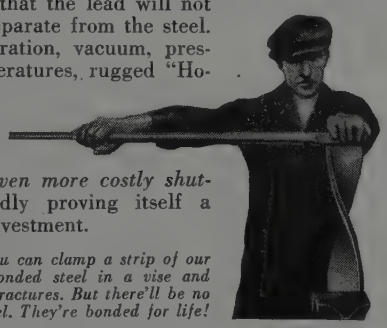

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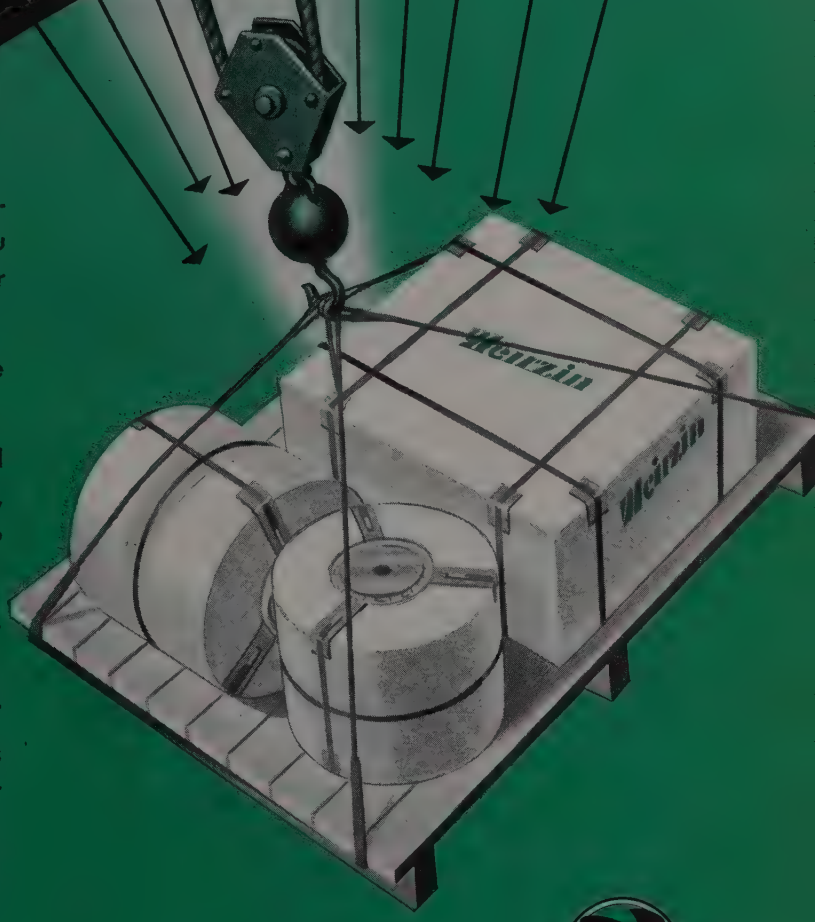

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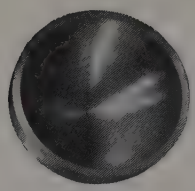

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for greater accuracy

Molds, dies and similar contour boring jobs are a "natural" for the Monarch Air-Tracer.

With this new lathe attachment you can handle such work faster, for lower cost—and *more accurately*—because the cutting tool motion is stepless. Finish is better, tolerances are closer; the slightest change in template shape is instantly translated into slide feed.

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THE MONARCH MACHINE TOOL COMPANY
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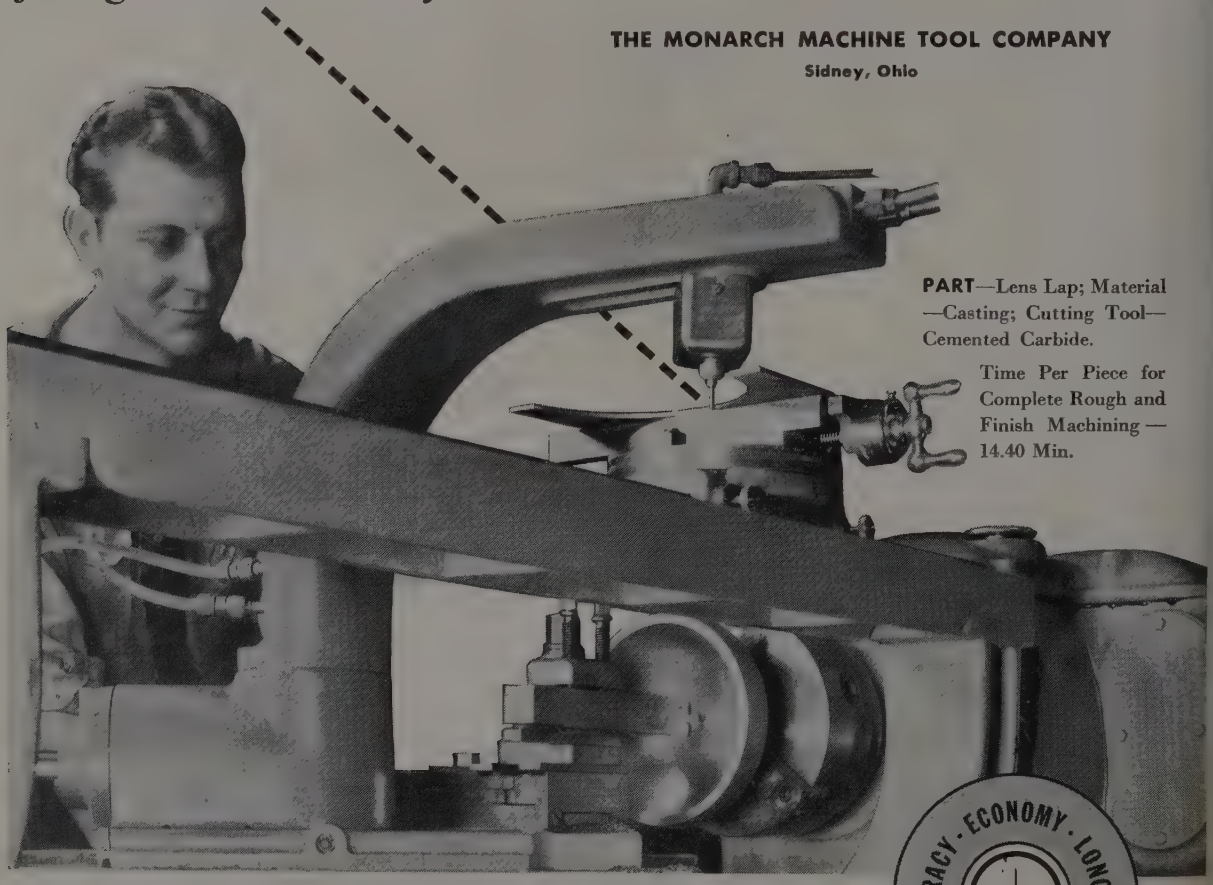

PART—Lens Lap; Material—Casting; Cutting Tool—Cemented Carbide.

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1. Stepless cutting-tool motion provides a superior continuous finish.
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3. Automatic yet versatile operation results in economical, accurate high production.

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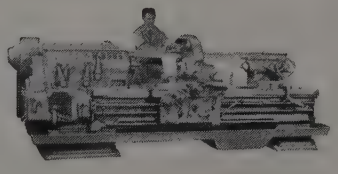

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Cutting Costs, Increasing Output with Modern Machine Tools—Turning
Composite Materials
High Top Pressure Operation
Finishing Magnesium Alloys
Drawing Steel with Zinc Alloy Dies

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 120, NO. 22 JUNE 2, 1947

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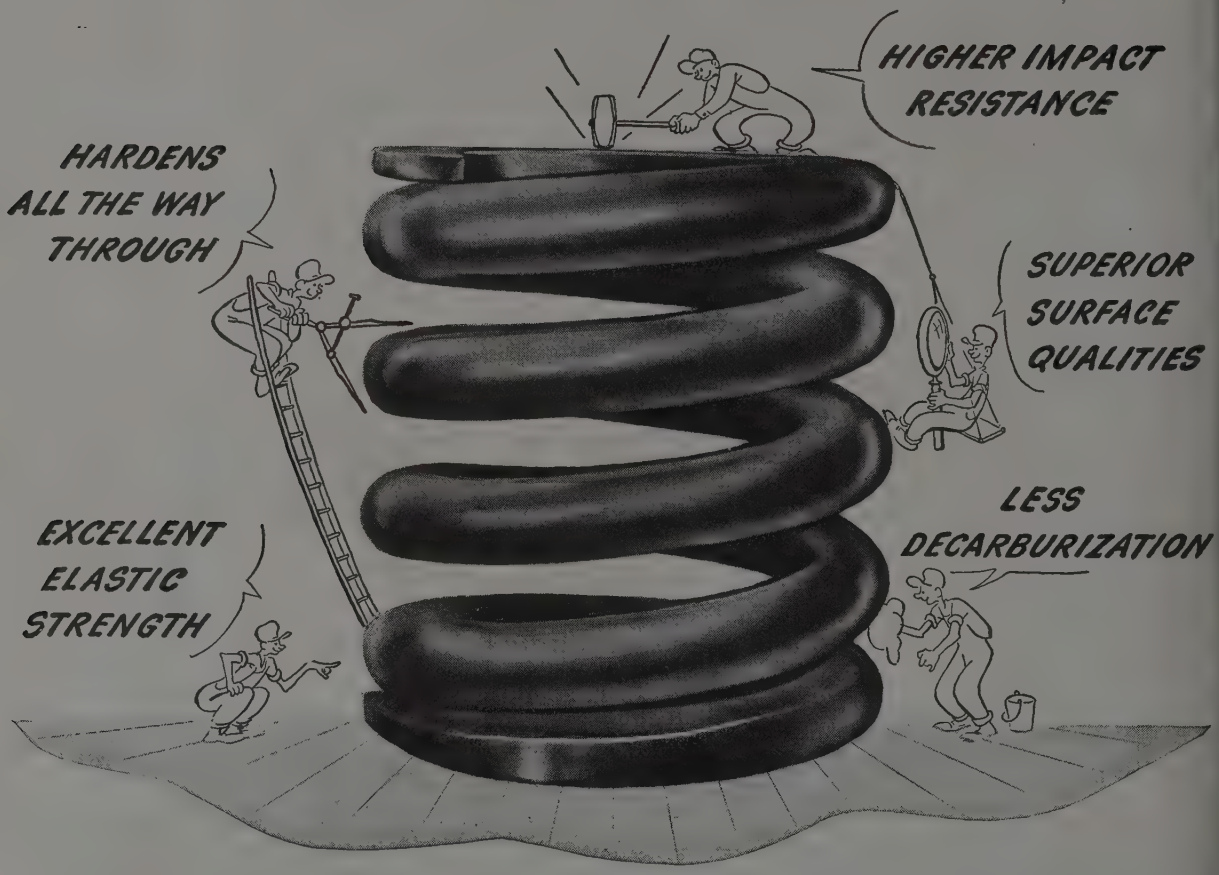
★—Denotes regular features.

Hot Coiled Springs Last Longer

when made of

Type "8655" Nickel Alloy Steel



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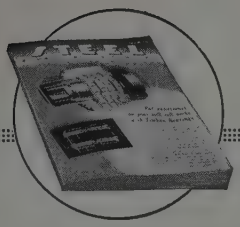


June 2, 1947

Free To Do What?

On April 29 the "Cincinnati Enquirer" ran a full-page ad by the American Federation of Labor headed "A Free America Cannot Exist Without Free Labor," labeled as "a 1947 appeal to reason" and explained as "the first of a series which will expose the dangers of the Taft-Hartley anti-labor program."

The ad asserts that the first step toward totalitarianism starts with the shackling of labor and that "the enslavement of the working man by prohibiting free bargaining among freemen would wreck our nation's position as defender of democracy in the fight to halt further expansion of communism."

A day after the AFL ad appeared, the "Enquirer" carried a third-page ad signed by Fred Kammann over this statement: "(I happen to be vice president of Roy S. Durstine, Inc., advertising agency, and manager of the Cincinnati office. Above are my personal views and not necessarily those of my company. I'm paying for this ad myself.)"

His ad was headed "Yes, We Need Free Labor, But Free To Do What?" The text in part read as follows: "I share with the rest of the public . . . the experience of having my affairs periodically messed up by 'free' labor. They are 'free' to cut off my fuel, 'free' to interrupt my communication, they stop my food deliveries, they shut off my electricity. In short, this 'free' labor doesn't give a damn about me or even their own members who happen not to be involved in the particular disturbance of the moment.

"I agree that we need 'free labor'; free to work where it wants to work without enforced tribute or coercion . . .; free to turn out an honest day's work if it so chooses; free to recognize that labor costs are a part of all prices no matter who propagandizes to the contrary. That's the kind of 'free labor' we need and the kind that actually did build up this country."

The reaction to Mr. Kammann's ad was significant. By phone calls that tied up the switchboard and by letters men and women in and out of labor expressed their approval of his stand. Theirs was the voice of millions who are not anti-labor at heart but who are tired of being the recurrent victims of labor's abuses of power.

President Truman is about to approve or veto the labor bill. For guidance he could obtain highly relevant information from the response to Mr. Kammann's courageous ad.

° ° °

RESTORE SCRAP CYCLE!: President Robert W. Wolcott of Lukens Steel told members of the Association of Iron & Steel Engineers that the national scrap inventory now is lower than it was in 1942 and emphasized the importance of doing something constructive about the scrap situation.

This is a timely and a necessary warning. Too few leaders in business and in national affairs seem to realize that our economy is harnessed to a continuous cycle whereby a mounting percentage of steel produced goes back to the furnaces in the form of scrap. Only since 1911 has steel ingot output exceeded pig iron output. Availability of scrap has permitted steel output to move ahead of pig iron output steadily until in recent years the margin was over 25 million tons annually.

During the war much of our steel went abroad and the scrap return from it was lost. This caused a famine in scrap. Now the job is to restore the old cycle as soon as possible. Unless we can do this, the alternative is to increase pig iron capacity appreciably which would entail still heavier drains upon our dwindling reserves of iron ore.

The routine we have been developing for many

(OVER)

years in utilizing scrap instead of tapping virgin ore and coal is a priceless asset of our American system of manufacture. We should restore it at the earliest possible moment. —p. 74

° ° °

HELPING MAN PRODUCE: One could start an endless argument by asking whether the machinist of today is superior or inferior to his predecessors in previous generations. Regardless of what the correct answer may be, it is true that the productivity of American industry progresses not so much by virtue of improvement in the mental and physical abilities of the workman as by the quantity and quality of mechanical aids that are placed at his disposal.

Today wage rates are far above anything that can be justified by current performance. The only way to absorb these abortive costs is to introduce better mechanical aids to permit workers to produce more goods.

This challenge makes the machine tool show to be held in Chicago in September an important event in the industry's postwar development. As Guy Hubbard puts it, some machines at the 1935 show were economic equivalents of the dodo bird in comparison with some 1947 models to be unveiled at Chicago. —p. 98

° ° °

SMALL BUSINESS AID: American taxpayers are underwriting appropriations for the Department of Commerce and for several congressional committees to carry on activities intended to promote the interests of "small business." So far, these activities have not produced any startling results, probably because the difficulties encountered by small business stem largely from unhealthy conditions created by other government agencies.

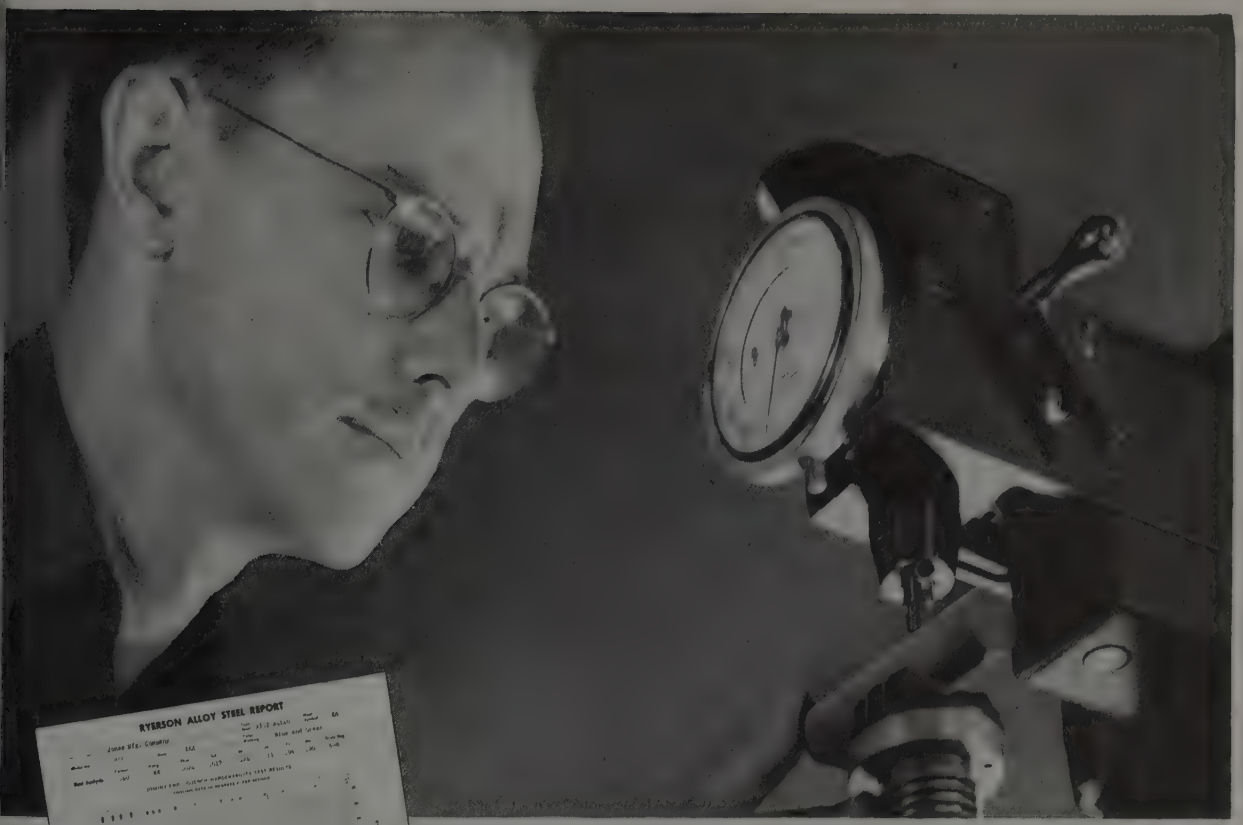
Our suggestion would be that people in Washington who really wish to help small business read carefully the careers of Henry Ford, A. W. Henn, August Tuechter and numerous others who built successful businesses from small beginnings. Then start weeding out or modifying some of the present governmental rulings that today deny business enterprises the opportunities they enjoyed when the late Messrs. Ford, Henn, Tuechter and others were working day and night to insure the success of their small businesses.

More freedom from bureaucracy would help small business enterprise in 1947 as much as any other single factor. —p. 103

SIGNS OF THE TIMES: Final form of legislation providing for a National Science Foundation remains in doubt. In the Senate an amendment to the bill, adopted by a one-vote margin, takes the control of the nation's science policies away from the scientists and gives it to the President. Another amendment was adopted which gives politicians a leverage on a substantial portion of the foundation's funds. These questionable features in this proposed legislation (p. 78) will remain unless they are thrown out in the House. . . . Consolidated Steel Corp. in September will begin fabricating 1000 miles of 26 and 30 in. pipe for an oil line from Saudi Arabia to the Mediterranean. Kenworth Motor Truck Corp., which has orders for 77 6-wheel-drive trucks to haul the pipe over the Arabian sands (p. 82), is testing the vehicles in the Arizona desert. . . . Strike of foremen at Ford Motor Co. may give impetus to passage by Congress and approval by the President of the Senate labor bill (p. 85) and also may lead to the creation of a new class of supervisors known as "plant engineers" to handle foremen's jobs. . . . Bethlehem Steel Co. annual report to employees reveals remarkable results of the company's safety program. Accident frequency in 1946 touched an all-time low, 64 per cent below the 1926 rate. In Bethlehem coal mines (p. 88), accident frequency and severity were respectively 60 and 29 per cent better than the averages for the industry for the previous year. . . . Output of crude petroleum in the week ended May 17 rose to a new record of a daily average of 5,008,050 barrels. This marks the second consecutive week in which a new record has been recorded. The gains (p. 90) are credited to increasing demand for petroleum products and to higher prices for crude. . . . Valentine Industries Inc., Wichita, Kans., employs welding in the construction of prefabricated stainless steel and aluminum sandwich shops (p. 116) which can be delivered to ultimate location with counter, stools and shelves in place. . . . Weirton Steel Co. now is operating a 42-in., 5-stand, 4-high tandem cold-reduction mill (p. 118) which is capable of rolling strip one-third faster than the previous record and almost three times as fast as most cold-reduction mills now in operation. United Engineering & Foundry Co., builder of this mill, has four others under construction for other companies.

E. L. Shaner

EDITOR-IN-CHIEF



.....The Proof of Performance is in the Testing

How Ryerson Tests Alloy Steel from Stock to Guarantee Quality and Guide Heat Treating

Will the finished part meet required physicals? How should you heat treat to obtain these physicals quickly and easily? That's the information you want when you purchase alloy steel. And that's precisely the information you get when you draw on carefully selected stocks of Ryerson Certified Alloys.

For, under the Ryerson Certified Steel Plan, we subject every alloy heat to a Jominy test which provides complete information on the steel's hardenability in the as-quenched condition. In addition, we test medium carbon alloys three more times to establish hardenability response after tempering at 1000°, 1100° and 1200° F.

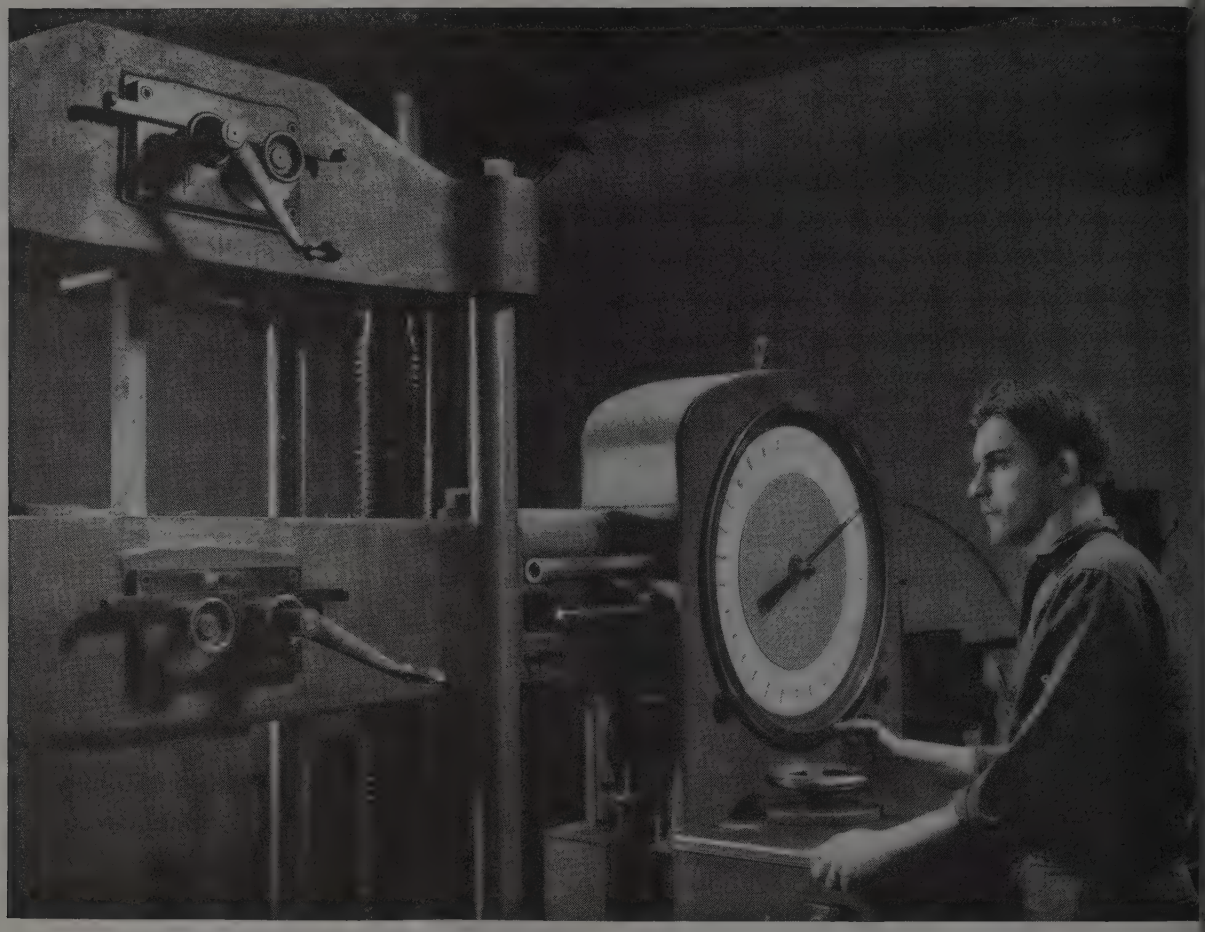
A complete report of these tests accompanies every order of annealed or as-rolled alloy steel leaving a Ryerson plant. It's a report telling heat treaters what they have to know to get accurate, dependable results, without losing time on experimentation or costly re-treating. It's proof to purchasing men that the steel fully meets the requirements of the order.

And to further eliminate the possibility of mistakes, the report records the chemical analysis of the heat as well as the color marking and heat symbol which identifies the steel shipped.

This comprehensive alloy steel-service is one of the many services designed by Ryerson to save time and trouble for steel users. And it graphically illustrates why it will pay you to get in touch with the nearest Ryerson plant for quick shipment of alloy steel—a single bar or a carload.

Joseph T. Ryerson & Son, Inc. Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles.

RYERSON STEEL



Mighty Muscles Test INLAND Steel

In the refining and rolling of Inland steel, every step is carefully controlled. But as a final check, each heat ordered to mechanical properties is physically tested to make sure it meets specifications. One of the basic and most useful mechanical tests is the tension test. Specimens cut from rolled sections are subjected to tremendous forces in the tension testing machine. Every sample must measure up to customer specifications—in yield point, ultimate strength, and elongation. This tension test is only one of many mechanical and chemical tests made on Inland steels to assure their unvarying uniformity and their suitability for the service they are to perform.

PRINCIPAL PRODUCTS

BARS • STRUCTURALS •
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STEEL
June
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1947

Sen. Edward Martin (Rep., Pa.), right, chairman of the Senate Small Business subcommittee, is shown with Raymond Dickey, chief counsel for the committee. The group is investigating alleged shenanigans in the steel products market. NEA photo

Push Probe of "Daisy Chain" in Steel

Senate Small Business subcommittee, investigating alleged irregularities in sale of steel in "gray" market, expected to continue hearings for another month. Little evidence of illegal operations uncovered to date

JUST where the Senate Small Business subcommittee hearing into gray market steel operations is headed was not clear last week.

To date some interesting and sensational testimony has been given, even gun-toting gangsters figuring in some of the purported and projected deals, but, except for the fact that a "daisy-chain" is operating in the sale of open market steel, little in the way of concrete evidence has been developed upon which to base corrective action.

The subcommittee has unearthed many leads to gray market transactions from the testimony so far, however, and plans to follow these through thoroughly. In fact, indications are the current series of hearings will last fully a month more.

While the subcommittee last week was not prepared to state it had uncovered definite proof of illegality in these gray market transactions, nevertheless if further investigation warrants, it will turn over its evidence to the Justice Department with recommendations that appropriate legal action be taken.

Spokesmen for the subcommittee point out that a huge sheaf of telegrams and letters, in addition to the testimony given at the hearing, show that substantial tonnages of steel in the aggregate have been offered and some tonnages sold at three times the market price.

On the basis of testimony so far developed, the bulk of the gray market steel appears to have originated in shipments by the mills on housing and export allocations. Some of these allocations evidently were diverted after receipt of the steel by second parties who had been designated by government agencies to receive it. The subcommittee is uncertain whether such diversion is or is not illegal and has asked the Justice Department for a ruling.

One witness, president of a prefabricated house company, testified his company had been forced to sell some 2000 tons of steel because it was impossible to obtain sufficient other materials to proceed with the manufacture of prefabricated houses. The company, it appears, was compelled to dispose of its steel to meet payroll and other obligations.

Another witness, a veteran, told the committee he had sold 250 tons which he had purchased from a Pittsburgh dealer for from $165 to $205 per ton.

Last week the subcommittee heard Edgar Kaiser of the Kaiser-Frazer Corp., Willow Run, Mich., tell how his company had bought an interest in the Ports-

mouth Steel Corp., Portsmouth, O., and made exchange deals to swap pig iron for finished steel with other producers in an effort to obtain steel for automobile manufacture.

He related that after failure to obtain steel from regular producing companies which declined to supply his firm on the ground they were taking care of prewar customers first, and after failure to obtain supplies on appeal to the Civilian Production Administration, his company, with Graham-Paige, purchased a combined total of 25 per cent interest in the Portsmouth company. This latter firm had taken over the old Portsmouth, O., plant of the Wheeling Steel Corp. Kaiser-Frazer was to get as part of the arrangement purchase rights on 7900 tons of sheets, plus the same amount of slab per month, and Portsmouth also was to furnish 5000 tons of wire products per month. Kaiser-Frazer later bought an idle blast furnace at Struthers, O., and trades pig iron to other producers for finished steel, the witness said.

Spokesmen for the subcommittee last week said the body would look further into the statement of Charles A. Margiotti, former Pennsylvania attorney-general, who said he had been told by a client that executives of five big steel companies were to share in an $18 million total profit on gray market sales.

The subcommittee also is delving into the question of government export policy, particularly with regard to Russia, as a result of testimony at the hearing.

State and Commerce Department officials have disclosed American exporters shipped more than half as much seamless steel pipe to Russia during January and February this year as they did in all

(*Please turn to Page* 172)

Some Steel Buyers Seen Favoring "Pittsburgh Plus" Restoration

Return to former steel pricing system unlikely in view of government drive to effect complete fob mill pricing. Change in consumer view on subject, stimulated by existing supply scarcity, confirms argument in support of old practice

WITH steel consumers in some areas pinched for supplies of metal because of dislocations in distribution accompanying transition from wartime to peacetime marketing practice, talk is heard in the trade that a movement is gaining momentum in consuming circles aimed at restoring "Pittsburgh Plus" pricing which was abolished in 1938 when the steel industry adopted the multiple basing point system on a wide scale.

Abandonment of "Pittsburgh Plus" followed years of pressure from the Federal Trade Commission and other government agencies which were strongly supported in their position by steel buyers who protested paying so-called "phantom" freight from Pittsburgh on their purchases.

Steel producers had insisted that "Pittsburgh Plus" pricing served to equalize steel costs to consumers, at the same time leaving the various consuming areas open to widest possible competition between the steel producers, and providing multiple supply sources for consumers no matter where located. It was maintained it prevented local monopolies of markets by local steel producers. Some economists predicted widespread migration of industry with resulting economic dislocations would follow abolition of the historic system.

Despite the steel men's argument "Pittsburgh Plus" was abolished, giving way to the multiple basing point system of pricing. However, the full effect of the demise of "Pittsburgh Plus" on distribution was postponed during the war years because of the imposition of government controls on prices, production and shipments. With the war over and a free economy restored, however, it became evident almost immediately that the steel men's arguments for "Pittsburgh Plus" had merit. Disinclined to absorb freight charges on shipments distant from their mills when sufficient business was close at hand to keep plant capacity engaged, some producers began to withdraw from certain selling areas with the result that many consumers have been forced to seek out new supply sources. This has been an extremely difficult task, and in some cases buyers have found it virtually impossible since mills close to them are booked to capacity with old customers.

Only recently, R. C. Todd, vice president, American Rolling Mill Co., Middletown, O., speaking at a meeting of the Pressed Metal Institute (STEEL, p.73, May 5), emphasized the major influence which abolition of "Pittsburgh Plus" is exerting in the distribution of steel. He predicted that the effects of

MASS PRODUCTION BOATS: Launching of the 1000th Steelcraft boat at the Churchward Co., plant at West Haven, Conn., within a year was the occasion for a recent celebration. Above, a dozen 26-ft cruisers are shown in armada maneuvers. Company believes its past year's record demonstrates the success of assembly line construction methods for steel pleasure craft. Acme photo

his action of 1938 would become even more noticeable as time passes.

So far no formal or other action aimed at restoration of "Pittsburgh Plus" has been taken but it is in the "talk" stage. The Federal Trade Commission has no requests from any industry or consuming group to reinstitute the old pricing practice and a spokesman for the commission told STEEL that if such requests were received the only response the commission could make is that such requests could not be ruled on inasmuch as basing point policy is entirely a matter of court interpretation of the law.

Viewed broadly, the FTC could hardly be expected to consider such a request favorably in view of its concept that basing point pricing systems should be broken down completely in the course of time and be replaced by fob production point prices. What the commission has in mind is attempting, by a gradual process, to bring about through the courts a system of fob mill prices.

Whether anything comes of the present talk about "Pittsburgh Plus" is problematical under the circumstances. The change of viewpoint on the subject as reflected in consumer talk at this time, however, is interesting, if not significant.

Vacuum Cleaner Sales Soar To All-Time High in April

Factory sales of household vacuum cleaners in April broke all records for the third consecutive month, totaling 330,426 units compared to 321,515 in March, and were 107 per cent above the April, 1946, figure of 159,558, according to C. G. Frantz, secretary-treasurer, Vacuum Cleaner Manufacturers' Association.

Sales for the first four months of 1947 reached 1,183,760 cleaners, compared to 544,642 in the like period of 1946, an increase of 117 per cent. The four-month total is slightly higher than one-half that for all 1946, Mr. Frantz reported.

Building Decline Cuts Structural Steel Bookings

Drop in tonnage ordered during April reflects depressive effects of high construction costs and restrictions

DEPRESSIVE effects of high construction costs and government restrictions are reflected by a decline in orders placed in April for fabricated structural steel.

Orders booked that month aggregated an estimated 143,101 tons, compared with 149,634 tons in March, according to the American Institute of Steel Construction, New York. Despite the substantial amount of new construction contemplated, the orders placed during the first four months this year totaled only 523,589 tons. The 1936-1940 average for that period was 439,199 tons.

Tonnage shipped in April was only slightly above that moved in March, the April shipments amounting to 138,982 tons compared with 137,799 in the preceding month. Total shipments in the first four months of 1947 were 553,557 tons, compared with the 1936-1940 average for that period of 419,885 tons.

Although the backlog of orders for fulfillment in the next four months rose to 631,636 tons at the end of April compared with 614,023 tons at the end of March, the March and April backlogs were lower than any since May of last year.

It is reported some shape mills will be fully caught up in the third quarter on orders, with a possibility there will be little rationing of tonnage by producers for the fourth quarter unless there is sharp improvement in building work. During April, construction work was still tightening up, the F. W. Dodge Corp., New York, reporting that in the 37 eastern states the nonresidential volume of contracts awarded totaled $184,317,000, down 4 per cent from March and 22 per cent from April, 1946.

Senate Group Investigating Reports of Slow Scrap Sale

Reports that government-owned scrap is not being sold rapidly enough are being investigated by the Ferguson surplus subcommittee of the Senate committee on expenditures. The scrap is that contained in obsolete and over-age machine tools, ships and other surplus property.

Present, Past and Pending

■ ESTABLISHES FIXED PRICE FOR BRASS, COPPER GOODS

NEW YORK—To eliminate uncertainties and to help stabilize the copper price situation, Revere Copper & Brass Inc. will sell its products on a fixed price basis for 60 days ahead. Since the war company has been selling on basis of price at time of delivery.

■ AMERICAN SHIP CONSTRUCTION DWINDLES

NEW YORK—Unless the government finds it possible to provide some form of relief for United States shipbuilding, only repair work will be done in American yards, E. G. Grace, chairman, Bethlehem Steel Corp., told employees in annual report. Only 26 new vessels are under construction in company's yards.

■ 647-MILE PIPELINE CONSTRUCTION TO START

FT. WORTH, TEX.—Magnolia Pipe Line Co. will start construction of a 20-in. pipeline from Corsicana, Tex., to Patoka, Ill., this week. The 647-mile line will have a capacity of 100,000 barrels daily and will make first deliveries in January, 1948.

■ IMPROVED GASOLINE ENGINE DEVELOPED BY GM

CHICAGO—Changes which will improve the gasoline engine's efficiency by one-third have been developed by General Motors, Charles F. Kettering, research vice president, told the Inland Press Association. The developments, which will not be marketable immediately, will be fully described at this week's meeting of the Society of Automotive Engineers at French Lick, Ind.

■ RAILROAD UNIONS PRESS FOR RULES CHANGES

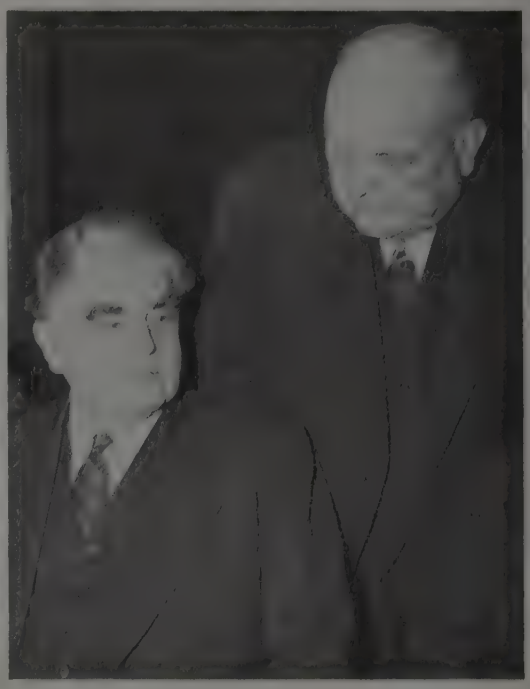
CLEVELAND—Officials of five operating railroad brotherhoods have called upon the carriers to negotiate on a nationwide basis the union's demands for 44 working rule changes. The changes are those deferred a year ago when President Truman ordered government seizure of the roads after a two-day strike by the engineers and trainmen.

■ WIRE FACILITIES TO BE EXPANDED

BRISTOL, R. I.—United States Rubber Co. will increase its wire production facilities to three times its prewar output by installation of new rubber and plastic insulating equipment.

Hope for Coal Pact By June 30

More nonbasic steel companies reach agreements with United Steelworkers. Unions intensify campaign against reform labor legislation



PEACE? Reversing his previous demand for nothing less than industry-wide bargaining, John L. Lewis has opened separate negotiations with northern and southern coal operators, which industry hopes may lead to peace in the coal fields this summer. Here Lewis is shown conferring with Ezra Van Horn of Cleveland, chairman of the wage conference with northern operators. NEA photo

WHILE comparative labor peace prevails in the metalworking industries and interruptions to production currently are minor, management is following closely developments in the following fields:

1. Coal—John L. Lewis is conducting separate negotiations with the southern coal operators and with the northern and western operators. This is considered a good omen for peace in the mines this summer, although Lewis' demands are reported to be high.

2. Nonbasic Steel—Settlement of wage disputes between the steel consuming industries and the United Steelworkers is continuing. A substantial number of the 1100 companies in this category have signed agreements; a few are struck; many are still in the negotiating process. Settlements vary, ranging from pay increases of about 8 cents an hour to a more general 12½ cents plus fringe concessions.

3. Labor Legislation—Unions are waging a bitter and vigorous battle against the compromise labor reform bill. Congressmen and the President are being bombarded with telegrams and letters and the union press and union leaders are crying out against the bill's provisions. Industry's support of the measure likewise is being made known in Washington, but with considerably more restraint.

On the fringe, walkouts by foremen at several plants are receiving attention. Following the strike by the foremen at Ford Motor Co. (see page 85), about half of the supervisory employees at Midland Steel Products Co. walked out last week in protest against what they called company "raiding" on their membership. Production at both plants was maintained despite the strikes.

Prospects for peace in the coal fields brightened when John L. Lewis reversed a previous stand and agreed to meet separately with the southern and northern operators. The southern operators account for about 25 per cent of coal production, against nearly 75 per cent for the northern and western operators.

Negotiations with the southern group started last Wednesday. Talks already have been held by the northern operators and Lewis.

While Lewis' demands had not been announced publicly late last week, sources close to the negotiators said the miners' chieftain is asking for concessions which would add $450 million annually to the present coal payroll of $1.2 billion. Were these demands granted, they would raise the labor cost of mining coal from about $2 a ton to about $2.75.

Included in Lewis' preliminary demands is a request for the same pay for 40 hours' work that the miners now are receiving for 54 hours. Other items figuring in the union's proposals are: Time and a half for Saturday as such; payment for the eighth hour of work at overtime rates; retention of the federal safety code incorporated in the government's agreement with the miners; union control of the welfare fund, instead of joint control and a larger contribution by the operators to the fund; inclusion of supervisors in the contract; and a half-hour lunch period.

These are understood to be talking points introduced by Lewis and the operators believe he will bargain on most of them.

To date the meetings between Lewis and the operators have been amiable, a fact that has encouraged hopes that an agreement will be reached before July 1 when the mines must be returned to their owners by the government.

Nonbasic steel companies have been conducting negotiations with the United Steelworkers individually. Several dozen settlements have been publicly announced. These agreements indicate a considerable range in the amount of pay increases granted and in the fringe concessions allowed.

One New York state company effected a new contract calling for 5 cents an hour for day shift workers and 10 cents an hour for the afternoon shift. Two additional paid holidays, making a total of four, were granted both shifts and the company agreed to pay 2 cents per employee for "Blue Cross" insurance. Company estimates total cost of the settlement at 8 cents an hour.

In a majority of the settlements announced, companies have granted a pay increase of 12½ cents an hour and fringe concessions were negotiated on a widely varying basis. In some cases, the pay increase was made retroactive, and in some cases it was not. Some agreements provided for liberalized holiday and vacation plans. Some provided for adjustment of inequities in wage rates. Some provided call-in pay. Some provided for severance pay. Many are for two years.

A few pay increases exceeding 12½ cents an hour were granted.

Contracts between the union and the nonbasic steel companies expire at varying dates, with most running out by June 15. Many companies are still negotiating

with the union while continuing to operate. A number of companies have been struck and a few are still closed.

The nonbasic steel companies have waged a vigorous fight to be divorced from the basic steel industry in their negotiations with the union. To an extent, this has been successful. Individual negotiations have been recognized by top union officials. The position of the steel-consuming companies has been recognized by the Washington lawmakers and has influenced the drafting of the pending labor reform bill. However, the rise in basic steel wages has necessitated a similar increase in nonbasic steel, regardless of the companies' ability to pay.

As the compromise labor reform bill heads for the floors of Congress, union spokesmen stepped up their attacks on the measure. Unions are exerting all the pressure they can muster upon the President to veto the bill, if passed by Congress as expected. They are working on senators and representatives to support the President's veto, if given.

Ford Makes Offers to UAW

Ford Motor Co. late last week made two offers to the United Auto Workers. The first would extend the present contract 1 year and provide for a 15 cents per hour wage increase effective May 31. The second offer suggests negotiation of a new contract to become effective June 15. This contract would have the same wage provisions as the first offer. Acceptance of the offer by the union, it was said, would add $43 million to Ford's annual labor cost. In announcing the offers Ford also stated that effective June 1 all salaried employees receiving less than $1000 per month, would receive increases of 10 per cent.

Armco Workers Reject CIO

Employees of the American Rolling Mill Co. at Middletown, O., last week voted two to one against the United Steelworkers of America-CIO and in favor of the Armco Employees Independent Federation as bargaining agent in an election conducted by the National Labor Relations Board.

This makes 11 times that the CIO has been rejected by employees of Armco's major plants.

Iron and Steel Exports Up In March Over February

Semi-manufactured iron and steel exports gained in March over February, according to the Department of Commerce. Exports from the United States in March were valued at $38,300,000, compared with $28 million in February, and $13,900,000 for March a year ago.

Shipments of iron and steel scrap were valued at $200,000 in March, $100,000 in February, and $200,000 in March last year.

Other shipments reported included: Steel ingots, billets, bars, rods, etc., $14,300,000, compared with $9,900,000 in February and $4,800,000 for March, 1946; plates, sheets, etc., $14,700,000, compared with $11,400,000 and $5,900,000 respectively; tin plate and taggers' tin, $6,200,000, compared with $4,200,000 and $1,300,000 respectively; ferromanganese and other ferroalloys, $500,000, compared with $400,000 and $100,000 respectively; copper ingots, billets, plates and rods, $4,500,000, compared with $3,200,000 and $1,300,000 respectively; brass and bronze semi-manufactures valued at $700,000, compared with $500,000 and $200,000 respectively.

Exports of steel mill manufactures in March were valued at $31,900,000, compared with $24,200,000 in February and $15 million in March last year.

May Build New Oil Pipeline From West Texas to Coast

Construction of a 20-inch crude oil pipeline from West Texas to California is under consideration by a group of six oil companies headed by Shell Oil Corp., New York. Tide Water Associated Oil Co., Texas Co., Richfield Oil Corp., all of New York, and Union Oil Co. of California and General Petroleum Co., both of Los Angeles, are understood to be involved in the project.

The line will go from Winkler County, Texas, to Wilmington, Calif., where the participating companies have refineries. The carrier will have an initial capacity of 150,000 barrels of crude oil daily with the possibility of stepping it up to 225,000 through erection of additional pumping stations.

Output of FM Radios Jumps 47% in April Over March

Output of radio receivers with frequency modulation jumped 47 per cent in April over March. Radio Manufacturers Association reported 98,625 sets with FM bands put out in April compared with 67,264 in March. Total radio production during April reached 1,759,723 as against 1,377,269 in March.

Television receiver output also showed a slight gain, reaching 7886 for April, with 6639 in March. Total television receiver production for the first four months of 1947 was 26,205. Total FM-AM output during the same period was 284,432, while production of all receivers during the first third of the year reached 6,081,129 sets.

Gear Sales Up in April; Foundry Equipment Off

Mixed trends in equipment buying are shown by figures released recently by the Foundry Equipment Manufacturers Association, Cleveland, and the American Gear Manufacturers Association, Pittsburgh. The gearing industry, as represented by AGMA, shows an increase of over 11 per cent in volume of sales for April, as compared with March. Its index, which does not include turbine or propulsion gearing, was 424 in April.

Net orders closed by the 27 companies reporting to the Foundry Equipment Manufacturers Association show total sales and sales of new equipment at the lowest point since last December, with the index figures (1937-1939=100) at 512 and 446, respectively. Repairs to foundry equipment, however, have risen and in April were at 728 per cent, the highest point since the base period.

Malayan Government Aids Restoration of Tin Mining

Restoration of Malayan tin mining operations to normal is under way. Aided by Malayan government loans at low interest rates, tin mining companies are repairing war damage to tin dredges, and it is estimated 90 per cent of the prewar production rate will have been restored by 1949.

The Federated and Unfederated Malay States had a prewar output of about 75,000 tons of tin annually, valued in excess of $75 million. The output comprised about 35 per cent of the world's production. During the war, the Japanese worked the mines and recovered about 36,000 tons of metal. Heavy destruction of mining property accompanied their withdrawal, and the financial assistance of the Malayan government was needed for rehabilitation.

April Pig Iron Output Declines from March

April pig iron production totaled 4,784,042 tons, against 5,077,383 tons in March, according to the American Iron & Steel Institute. Total output for the first four months this year was 19,384,850 tons.

Ferromanganese and spiegel production was 45,675 tons in April, bringing total for year to 204,538 tons. Total blast furnace output for the first four months was 19,589,388 tons.

April operations were 89.3 per cent of capacity and the average for the first four months was 90.6 per cent.

Urges Responsibility for Scrap Program Be Given to Government

Lukens Steel president, speaking at meeting of Association of Iron & Steel Engineers, says national scrap inventory is well below level of 1942 when collection drive was necessary and suggests Congress grant agency broad powers to restore stockpile

DECLARING that the national scrap inventory is well below even what it was in 1942 when it was necessary to instigate a nationwide collection drive to meet the war emergency, Robert W. Wolcott, president, Lukens Steel Co., Coatesville, Pa., last week urged that legislation be passed placing responsibility upon the federal government for development of a real scrap conservation program.

In fact, he said, this is one of the suggestions now proposed by the scrap committee formed some time ago and comprising three members each from the steel, the scrap, and the foundry industries.

Speaking at the dinner of the Association of Iron & Steel Engineers, which held its spring conference May 26-27 at the Benjamin Franklin Hotel, Philadelphia, Mr. Wolcott outlined various difficulties scrap consumers and sellers have had in impressing Washington with the urgency of the present situation.

Suggests U. S. Bureau Handle Job

"We, therefore, feel," Mr. Wolcott said, "that the only hope for results is to have legislation enacted which will place the responsibility for conservation of scrap in the lap of one of the government bureaus. It is hoped that Congress will grant broad powers to this bureau so that through acquisition and conservation methods our stockpile may be built up to an adequate basis."

He stressed also the importance of the public educational job to be done, and said that the scrap committee will have a study made of (A) the effect of exports and loss of potential scrap through the prosecution of the war in Europe and the Pacific islands; (B) the trend of obsolescence of scrap potentials in this country, such as buildings, bridges, equipment, etc.; (C) the subject of future requirements for scrap and its relation to the world problem of metallics, especially iron ore.

Mr. Wolcott spoke on the discouraging experiences of the metalworking trades in obtaining scrap through the War Assets Administration and said that "It is perfectly apparent, as in so many other cases within the government, that liquidation of WAA will be prolonged as far into the future as possible in order to save jobs."

While the conference was held under the auspices of the AISE Rolling Mill Committee, there was by way of an innovation a series of parallel technical sessions which broadened the scope of the program to include papers of general interest to all steel mill men, as well as to rolling mill operators. Approximately 500 were present.

All technical sessions were held on the first day with the second day given over to an inspection trip through the plant of the Lukens Steel Co., Coatesville, Pa.

One technical session was devoted to the presentation of papers on the "Design, Construction and Lubrication of Mill Couplings and Spindles," by William L. Stover, mechanical engineer, Mesta Machine Co., Pittsburgh, and on "The Art of Rolling Hexagons and Octagons," by Charles P. Hammond, superintendent, rolling mills, Atlas Steels Ltd., Welland, Ont. Anders G. Ericson, chief engineer, Homestead steelworks, Carnegie-Illinois Steel Corp., Munhall, Pa., and Louis Moses, superintendent, rail mill and roll departments, Bethlehem Steel Co., Sparrows Point, Md., were co-chairmen.

At another related session, a paper, "Bearing Construction and Performance Characteristics," was presented by E. Crankshaw, assistant chief engineer, Cleveland Graphite Bronze Co., Cleveland, while a paper, "Welding of Steel Strip for Continuous Cold Rolling," was presented by Henry Griffith, welding engineer, Federal Machine & Welder Co., Warren, O. C. R. Hand, assistant superintendent, mechanical department, Bethlehem Steel Co., Sparrows Point, and I. N. Tull, electrical superintendent, Republic Steel Corp., Cleveland, were co-chairmen.

Still another session was devoted to papers on "Remote Control of Continuous Slab Heating Furnaces," by C. E. Duffy, assistant fuel engineer, Bethlehem Steel Co., and to "Republic's Chicago 44, 36 and 32-in. Mills—Layout and Operations," by R. F. Lavette, superintendent of these mills, and "The Manufacture of Wrought Steel Wheels," by Robert Merk, assistant to chief engineer, and William Ashton, superintendent, Wheel & Axle Division, Carnegie-Illinois Steel Corp., Munhall, Pa. N. C. Bye, director of engineering, Henry Disston & Sons Inc., Philadelphia, and S. C. Read, superintendent, rolling mills, Jones & Laughlin Steel Corp., Pittsburgh, were the co-chairmen.

The fourth and last technical session related to "Production, Power Requirements and Design of Modern Cold Drawn Equipment," by Glenn W. Garwig, sales engineer, and A. L. Thurman, assistant to the vice president, Aetna-Standard Engineering Co., Youngstown; "Problems of Strip Mill Speed-ups," by F. Mohler, president, Patterson-Emerson-Comstock Inc., Pittsburgh; and "Modern Methods of Fresh Water Conditioning for High Pressure Boiler Plants," by S. D. Distelhorst, Cochrane Corp., Philadelphia. M. B. Antrim, technical assistant to electrical superintendent, Lukens Steel Co., and F. C. Schoen, plant engineer, the Midvale Co., Nicetown, Philadelphia, were co-chairmen.

Industrial Furnace Manufacturers Discuss Materials Handling, Continuous Operation

IMPROVED materials handling equipment engineered into industrial furnaces making possible the heat-treatment and surface finishing of steel and other metals in greater volume with reduction in furnace time and the trend toward continuous operation and output was stressed at the annual meeting, Industrial Furnace Manufacturers' Association, Hot Springs, Va., May 19-21.

This is an important factor contributing toward lower costs and is expected to be a leading sales presentation in sustaining demand for the equipment.

The cost of producing this equipment is up 66 per cent over the 1936-40 average and lowering of this cost and improved selling methods was the theme of the three-day convention.

William Adam Jr., Ajax Electric Co., Inc., Philadelphia, was elected president for the coming year, replacing C. F. Olmstead, who becomes automatically a member of the board of directors. Directors, one year:

Steel division, F. W. Brooke, Swindell-Dressler Corp., Pittsburgh; glass, J. Earl Frazier, Frazier-Simplex Inc., Washington, Pa., and electric division, J. J. Walker, C. I. Hayes Inc., Providence, R. I.

Two-year term directors: combustion division, W. E. Borbonus, R-S Products Corp., Philadelphia; oven division, S. W. Fletcher, J. O. Ross Engineering Corp., New York, and ceramic division, Ruhl T. Cadwell, Holcroft & Co., Detroit. R. W. Porter, Swindell-Dressler Corp.,

Pittsburgh, was reappointed treasurer.

There will be a one-day business meeting of the association, Pittsburgh, in January, 1948, and the annual meeting, Hot Springs, Va., May, 1948.

American Electroplaters' Society To Meet June 23-27

Highlighting the 34th annual convention of the American Electroplaters' Society, Hotel Statler, Detroit, June 23-27, will be the Industrial Finishing Exposition at Detroit's Convention Hall. Taking place for the first time in 11 years, the exposition will feature displays of 100 manufacturers and suppliers to the metal finishing industry.

A full program including five technical sessions as well as plant visits to many of the larger manufacturing companies in the Detroit area is planned.

The first session will include the following subjects and speakers: "Stress in Electrodeposits and Its Significance," K. G. Soderberg and A. K. Graham, Graham, Crowley & Associates Inc.; "Stress in Electrodeposited Nickel," William Phillips and F. L. Clifton, General Motors Research Division; "Physical Properties of Electrodeposited Chromium," Abner Brenner, Polly Burkhead and Charles W. Jennings, National Bureau of Standards; and "Bright Brass Plating of Zinc Base Die Castings," Stanley J. Beyer, Hart Mfg. Co.

Speakers at the second session, which will be held Tuesday, June 24, follow: B. C. Case, Hanson-Van Winkle-Munning Co., whose topic is "Modern Applications of Electroplating Solution Purification;" Alfred S. Kasdan, Kollsman Instrument Division, Square D Co., on "Electroforming Pilot Static Tubes;" Abner Brenner and Grace Riddell, National Bureau of Standards, on "Chemical Deposition of Nickel and Cobalt;" J. E. Starek and W. S. Cibulskis, United Chromium Inc., speaking on "Recent Development in the Use of Conversion Coatings on Zinc;" and Henry Strow, MacDermid Inc., "Bulk Nickel Plating."

Wednesday morning's program includes the third group of technical lectures, which are: "Barrel Chromium Plating," G. Dubpernell and S. M. Martin, United Chromium Inc.; "An Industrial Hygienist on Chromium Plating," J. E. Molas, City of St. Louis; "Standardization of Buffing for Preparation of Atmospheric Exposure Test Panels," C. C. Cupps, Standard Steel Spring Co., and A. K. Graham, Graham, Crowley & Associates Inc.; and "Evaluation of Buffability of Nickel Deposits," R. D. Miller, Bumper Division, Electric Auto-Lite Co., and A. H. Du Rose, Harshaw Chemical Co.

Two sessions will be devoted to reports on projects conducted by the AES Research Committee.

Postwar Progress, Developments In Powder Metallurgy Reviewed

Pre-alloyed materials attract major attention at New York meeting. Developments in processing parts, attainment of closer tolerances, effect on design and new tools for extrusion re-striking are discussed

NEW developments in powder metallurgy, notably in pre-alloyed materials, which now include a standard low-carbon stainless specification, came in for major attention at the third spring meeting of the Metal Powder Association in New York, May 27. Developments in processing parts, one involving essentially an extrusion principle, attainment of closer tolerances, effect on design, new tools for extrusion re-striking and a general summarization of postwar progress in this industry were reviewed.

Broadening application of products made from pre-alloyed stainless steel powder, the original grain boundaries being broken down and leaving a low carbon grain free of oxide, was discussed by John D. Dale, president, Charles Hardy Inc., New York, manufacturer of metal powders and ores.

Micro-Metallic Co., Forest Hills, N. Y., is producing stainless steel filters of standard 18-8 for industrial use where acid corrosion is encountered or high temperature operating conditions prevail. Filters are supplied with average pore openings ranging from 165 microns down to 4 microns.

By using tools designed for extrusion re-striking, Ford Motor Co. has been able to almost double length of oil pump gears, originally 1 in., to 1¾ in. E. E. Ensign, describing new developments in production of metal powder parts by Ford Motor Co., said other parts whose ratio of length to hole diameter was on the order of 9 to 1 have been produced with eccentricities 0.07 of 1 per cent of the length.

Greatest opportunities lie in the ferrous field of powder metallurgy in the opinion of A. J. Langhammer, president, Amplex Division, Chrysler Corp., Detroit. Being the younger, the ferrous end has not witnessed improvements registered in the nonferrous branch, but some recent developments in ferrous powders are noteworthy.

Manufacture of steel back, copper, lead-lined bearings with use of metal powder was described by E. R. Darby, director of research, Federal-Mogul Corp., Detroit.

Calendar of Meetings . . .

June 2-4, American Gear Manufacturers Association: 31st annual meeting, The Homestead, Hot Springs, Va. Association executive secretary is Newbold C. Goin, Empire Building, Pittsburgh.

June 2-4, National Association of Purchasing Agents: Annual convention, Waldorf-Astoria Hotel, New York. Association headquarters are at 11 Park Place, New York.

June 5-7, Electric Metal Makers Guild Inc.: Fifteenth annual meeting, Hotel Roosevelt, Pittsburgh. Association president is J. F. Arthur, Box 6026, Mt. Washington St., Pittsburgh.

June 6, Society of Exploration Geophysicists: Eastern regional meeting, Mellon Institute, Pittsburgh. Society address is P.O. Drawer 2038, Pittsburgh 30.

June 9-11, American Coke and Coal Chemicals Institute: Annual meeting, French Lick Springs Hotel, French Lick, Ind. Association executive secretary is Samuel Weiss.

June 9-17, University of Iowa: Management course on production planning, job evaluation, motion and time study, wage incentives and related subjects. Iowa City, Iowa.

June 11-12, American Management Association: Conference on general management problems, Hotel Waldorf-Astoria, New York.

June 13, Eastern States Blast Furnace & Coke Oven Association: Annual spring meeting, Chartiers Heights Country Club, Pittsburgh.

June 15-19, American Society of Mechanical Engineers: Semi-annual meeting, Stevens Hotel, Chicago.

June 16-20, American Society for Testing Materials: Fiftieth annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society headquarters are at 1916 Race St., Philadelphia 3.

June 17-19, Machinery Dealers' National Association: Annual convention, Netherland Plaza Hotel, Cincinnati. R. K. Vinson, 20 North Wacker Dr., Chicago 6, executive director.

June 23-27, American Electroplaters Society: Annual convention and Industrial Finishing Exposition, Detroit. Executive secretary is A. K. Graham, P.O. Box 168, Jenkintown, Pa.

June 23-28, Railway Supply Manufacturers' Association: Convention, Atlantic City, N. J.

June 24-27, National District Heating Association: 38th annual meeting, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J. Association secretary is John F. Collins Jr., 1231 Grant Bldg., Pittsburgh.

July 3-9, International Committee of Scientific Management: Eighth international management congress, Stockholm, Sweden.

July 7-12, First Annual Store Modernization Show: Grand Central Palace, New York. Managing director of the exposition is John W. H. Evans.

July 16-18, Industrial Diamond Association of America: First convention, Book-Cadillac Hotel, Detroit.

Aug. 21-22, Society of Automotive Engineers: West coast transportation and maintenance meeting, Biltmore Hotel, Los Angeles.

Aug. 22-23, Institute of Scrap Iron & Steel: Mid-year convention, French Lick Springs Hotel, French Lick, Ind. Executive secretary is Edwin C. Barringer, Normandy Bldg., Washington.

Demand for New Machine Tools Seen Larger After Fall Show

Deferment of tool buying until new models are viewed at the tool exposition held as important factor in current order decline. Builders note easing in components' supply but inventories are watched closely. Interest in foreign markets increases

CLEVELAND

OPTIMISM is rising in the machine tool building industry as preparations for the largest Machine Tool Show in history gather momentum. Long-term prospects for the industry appear good, cost-conscious prospective buyers seeing in the new tools means to increase productivity and thus offset higher labor and materials costs. Particular interest centers around foreign rehabilitation requirements, and a large number of tool builders have scheduled foreign tours for their high-ranking officials to develop the foreign market for American-made tools more fully.

A bright note in the current ordering and shipment of new tools is the foreign demand, which in April, as it has since the end of 1945, amounted to about 27 per cent of total reported orders and shipments. Cancellation rate of foreign orders, as reported by the National Machine Tool Builders' Association, is only slightly more than 10 per cent of reported cancellations for the industry, having fluctuated this year from more than half of all cancellations to the present low. Foreign unfilled orders are about 30 per cent of total backlogs, maintaining the proportion which has been relatively stable for about a year.

Domestically the current demand is spotty, many buyers deferring their purchases until the new models are unveiled at the September show. These deferments are regarded in the industry as a major factor causing the decline in new orders, which in April were at the lowest point, with the exception of February, 1946, since the war's end.

Contributing to hesitancy on the part of smaller operators to expand and modernize their facilities through purchases of new metalworking tools have been the recent actions by some of the larger manufacturing companies, General Motors Corp. and Harry Ferguson Inc., for example, in abandoning or postponing large-scale projects.

Because the tool building industry no longer has the critical raw material supply problems it had earlier this year, flow of electrical equipment, castings and other components generally having increased in satisfactory volume to sustain production, shipments of tools now outstrip new firm orders and have done so in increasingly larger amounts since last August. Builders are extremely wary, however, of buying components in excess of foreseeable demand and are watching their inventory positions carefully to avoid insofar as possible further unbalancing their stocks with high-priced materials in advance of needs.

Dollar volume of orders in April was 7 per cent below the March level and estimated total industry shipments of $26,723,000 were nearly 8 per cent under the $29,012,000 reported in March, the association reported.

Cancellations rose in dollar volume to the highest point since December, 1946, and were 27 per cent greater in April than in March, amounting to approximately 10 per cent of the volume of new orders placed during the latest period.

"TRAIN OF TOMORROW": General Motors' experimental train, carrying many innovations in railway travel, has just been launched on a 6-month tour of the nation which will take it to 30 leading cities for public exhibition. Outstanding feature is the Astra Dome observation roof lounge

Tool and Die Manufacturers Hear of Opportunities

Bright opportunities lie ahead despite present narrow profit margins, Clayton R. Burt, chairman, Niles-Bement-Pond Co., West Hartford, Conn., declared at the third annual New England Conference held recently at Springfield, Mass., under sponsorship of the National Tool & Die Manufacturers Association.

He emphasized the necessity of economy in government expenditures and tax reductions. Pointing out that the administration's backing of wage increases has forced costs to unreasonable levels, with a result profit margins are growing thinner and thinner, he declared production must increase and costs must come down.

Dudley Harmon, executive vice president, New England Council, reported that since 1939 the metalworking industries in New England had doubled their employment, which is now greater than that section's textile and leather industries.

George S. Eaton, executive secretary of the NTDMA, told of plans for seeking tax relief for small business. In addition, he emphasized the importance of an unequivocal free speech provision in labor law so that the small employer will feel free to talk frankly with his employees without fear of reprisal from the National Labor Relations Board.

Bryant Chucking Grinder Buys Facilities from WAA

Sale for $220,000 of a Springfield, Vt., surplus machine tool plant to its wartime operator, Bryant Chucking Grinder Co., has been announced by War Assets Administration. The property consists of north and south extensions to a building owned by the Bryant company, an office and engineering building and three minor structures.

Navy Simplifies Procedure for Plant Disposal

Navy department seeks to expedite carrying out of its industrial reserve program by sale or lease of facilities

TO EXPEDITE carrying out of its "industrial reserve program," under which ey war plants are to be disposed of by ale or lease, the Navy Department has dopted a simplified, short-cut proceure.

Key feature is a National Security lause recommended by the Army-Navy funitions Board last September and ince adopted by the three interested arties—the War and Navy Departments nd the War Assets Administration. Its urpose is to permit civilian production t these plants, as far as possible, while t the same time keeping them available or war production in the event of a naional emergency.

An important simplification has been nade in the method of appraising plant alues. The new method, a Navy spokesan told STEEL, "will expedite action y several months in most cases." Speedy egotiation of contracts, he went on, lso should result from the liberal guarntees under which the Navy is preared to compensate contractors for osses and expenses incurred as a result f carrying on under the National Seurity Clause.

Disposal of Reserve Plants Progresses

The Navy started out with a list of 51 plants that were to comprise its "industrial reserve." It has disposed of 10 f these plants by transferring them to he Naval Shore Establishment. It has isposed of four which do not lend themelves to civilian production by putting hem in storage status. Of the remaining 130, which lend themselves to civilan production purposes as well as to the roduction of war goods, eight already ave been sold under the National Seurity Clause—leaving 122 still to be old or leased.

The National Security Clause designates the plant as a "war reserve plant hat will be of vital interest to the naon in time of emergency."

Under such an agreement, title to the acilities is conveyed to the contractor ut there is created a dormant estate sually running for a period of 20 years n behalf of the government. This ormant estate will be activated only if, in the event of a national emergency, a mutually satisfactory supply contract cannot be negotiated with the government. Experience has shown that, in an emergency, supply contracts would be the usual procedure. In the exceptional case when it becomes necessary that the dormant estate be activated, the contractor retains title, and the government pays reasonable compensation for the right of the government to use the facilities and fair compensation for loss incurred with regard to work-in-process which cannot be completed due to activation of the estate. Upon de-activation of the estate, the government would pay reasonable costs for restoration of the facilities to a condition equivalent to that immediately prior to activation.

Navy spokesmen believe that the plant valuation simplified procedure and the compensation provisions will appeal to the industrial corporations involved. The Navy negotiators are instructed to consider such factors as the following: Original cost; reproduction cost; price obtainable at general sale; depreciation; obsolescence; current market value; advantage to the government of complete disposal in a single sale as contrasted with separate sales.

In general, according to the Navy Department's letter to negotiators, "the evaluation and allowance for the national security value of the facilities will reduce the price (as compared with valuations set prior to adoption of the present formula) which the government must demand for the facilities, and make it easier for the government negotiators to reach agreement with the contractor."

Steel & Wire's Chicago Mills Plan Open House

On June 9 and 11 the Chicago district mills of American Steel & Wire Co., U. S. Steel subsidiary, will hold public "Open House" with the combined attendance expected to run more than 20,000. June 9 will be Open House at the Waukegan plant; June 11 at the Joliet works. Plant tours will take about two hours to complete and will include visits to all major producing departments. At Waukegan visitors will see how 75,000 miles of wire are drawn every day from steel rods.

Joliet works will show visitors how steel rods are rolled from billets 30 feet long —how the billet heated to more than 2000 degrees can be rolled into several thousand feet of steel rod. The Joliet plant's wire drawing machines are included in the tour-route, as are its machines which weave farm fence or poultry netting; those which produce 130,000,000 pounds of nails per year; and those which twist and cut the wire into barbed wire.

Kaiser Asks RFC To Reduce Loan By $85 Million

Proposes cost of Fontana plant, plus Eagle Mountain Mine, plus capital and postwar facilities, be cut to $37 million

RECONSTRUCTION Finance Corp. has under consideration the proposal by Henry J. Kaiser that the federal lending agency write down the loans on the Fontana Steel Plant by more than $85 million. Under Kaiser's proposal, the steel plant would cost him only $37 million, including the Eagle Mountain Mine, working capital and postwar facilities. He proposes to buy the plant itself for 20.9 per cent of the construction cost.

Kaiser's proposal is supported by the Western States Steel Council. Kenneth Norris, president of the Norris Stamping Co., Los Angeles, and Morris Pendleton, president of Plomb Tool Co., Los Angeles and New York, represent the group.

RFC officials in Washington pointed out that there is no direct precedent for the refinancing plan proposed by Kaiser. Observers doubted that the plan would be accepted by RFC; some went so far as to predict that eventually the RFC would foreclose on the Fontana plant and offer it to the highest bidder.

In a letter to John D. Goodloe, RFC chairman, Kaiser asked that the original loans totaling $123,305,000 be reduced by $85,329,544 to $37,975,856. After deducting the payments already made on the principal, $17,852,840, Kaiser, under his proposal, would owe a balance of $20,123,016. This would be paid from two sources: $15 million from Kaiser Shipyards earnings and $5 million from private or public financing.

Kaiser and his West Coast supporters contend that the proposal would be fair and in line with government's policy of selling the Geneva plant for $40 million.

Some Geneva Steel May Go To Birmingham District

Many Birmingham district customers of United States Steel Corp., New York, are to be supplied by the corporation's plant at Geneva, Utah, Irving S. Olds, chairman of the board, revealed recently in an interview.

The Geneva plant, he said, can supply about 300,000 tons annually to customers presently supplied by Birmingham mills. He would not estimate the date of availability of such steel.

Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

Senate amendment gives President power to name director of National Science Foundation, taking control of science policies away from scientists. Pork barrel feature provides for allocation of funds on basis of geography and population

AFTER killing off a number of attempts to subject the proposed National Science Foundation to the will of politicians, the Republican high command in the Senate slipped badly at the last minute by allowing the Magnuson amendment to be adopted. This amendment, accepted by a one-vote margin, takes control of the nation's science policies away from the scientists and gives it to the President. The amendment contains some double talk to the effect that the scientists may make a recommendation as to who shall be named director, but the President can take such recommendations or leave them alone. If the Senate bill is approved by the House, the President will have an entirely free hand.

The Senate-approved bill also contains a pork barrel feature that would give politicians a leverage on a substantial portion of the foundation's funds. An amendment by Senator Morse provides for allocation of 25 per cent of the funds, or $4 million, to the various states. Two-fifths of this money would be distributed equally among the 48 states and three-fifths on the basis of population.

Fight Expected in the House

In the House the Senate-approved bill has been referred to the Committee on Interstate & Foreign Commerce, headed by Rep. Charles A. Wolverton (Rep., N. J.). This committee has some strong personalities, both Republicans and Democrats, who will oppose the provision to take the science program out of the hands of the scientists. While a fight is expected the outcome is not clear, particularly because of some of the influences that were disclosed in the Senate debate. Sen. H. Alexander Smith (Rep., N. J.), who steered the bill in that house, revealed, for instance, that one of the parties who came to see him in support of the proposal to give the White House the power to the name the science director was Dr. Vannevar Bush, who directed the government's wartime science program.

The sort of pressures that will be exerted on the director were indicated by some of the amendments defeated during the Senate debate. One was the Fulbright amendment to create a Division of Social Sciences.

All the so-called Senate "liberals" voted "yea" on the Magnuson amendment, included in this column were such names as Chavez, Fulbright, Ives, Kilgore, McGrath, Murray, O'Mahoney, Pepper, Wagner, etc. Some of the typical names in the "nay" column were Taft, Flanders, Wherry, Thye, Vandenberg, White, Wiley, Hickenlooper, Lodge, McCarthy, Malone, Baldwin, Bricker, Capehart, Donnell, Cordon, Capper, Ball, Ferguson, Dworshak, etc.

The Senate bill has a provision for a division on cancer and heart disease research which more properly belongs in the law on health and welfare generally slated for action next year.

Otherwise the Senate-approved bill provides for a program that is commendable in providing for support of science policies and research work that, without the availability of federal funds and national direction, might be neglected in many important particulars.

Army Reverts to Formal Bids

"As a result of the reconversion to peacetime activity and the restoration of competitive conditions," according to announcement by Undersecretary Kenneth C. Royall, the War Department is reverting to the policy of effecting practically all Army procurement by formal advertising for competitive bids. Excepting for special problems that may arise now and then, there will be no further procurement on a basis of negotiation. Hereafter bids will be opened and read publicly.

Labor Bill Proponents Optimistic

Republican strategists in both House and Senate are more optimistic as to chances for getting their omnibus labor law reform bill enacted and approved this year. The chief objective of the managers has been to agree on a final bill that can be passed in the Senate over the President's veto. The second objective is to send the bill to the White House, if possible, at a time when the public again is disturbed over labor trouble. John L. Lewis is looked to to furnish some aid; the conferees want to time the House and Senate action so as to send the bill to the White House when, as is expected to be the case, another big coal strike is in the offing. Even without that extra pressure, however, the conferees point out that the President signed the portal pay

URGES TAX MODERNIZATION: Secretary of Treasury John W. Snyder, left, urged that the entire federal tax structure be modernized but warned that any surplus revenue must be judiciously divided between debt retirement and tax reduction. Mr. Snyder is shown talking with Rep. Harold Knutson (Rep., Minn.), chairman of the House Ways & Means Committee, right, and Rep. Jere Cooper (Dem., Tenn.). NEA photo

bill and, hence, is unlikely to veto the labor bill without very serious consideration.

Study Labor Racketeering

Now that the 1947 labor bill is approaching final congressional action, the spotlight soon will be focused on the study of "labor racketeering" by the House Committee on Education & Labor. Chairman Fred A. Hartley Jr. (Rep., N. J.) thinks the testimony to be developed in this coming series of hearings will eclipse in general interest and importance that developed during the committee's hearings on the labor bill.

The list of witnesses to be called include such names as Tobin, Hutcheson, Moreschi, Petrillo, etc. Mr. Tobin is to be called on to answer a lot of questions about the use of the teamster's union in jurisdictional disputes; the committee investigators have accumulated data on lots of cases where the AFL teamsters' union has driven out of business firms that had no labor trouble of their own.

Also due to appear before the committee are law enforcement officers from such places as New Canaan and Stamford, Conn., and many other points throughout the nation where violence has been rampant and the perpetrators allowed to go without punishment. The committee has data on cases where suits for damages arising out of illegal acts of violence have been pending for as long as 14 months without being permitted by public servants to go to trial.

Snyder Reveals Tax Plans

One of the recent developments that may have a far-reaching effect in the near future insofar as business in this country is concerned is the change of mind in the Truman administration on the subject of tax law revision.

This was revealed when Secretary of the Treasury John W. Snyder appeared as the House Ways & Means Committee's first witness in its investigation of tax law revisions to be made in 1948.

"We are nearing lower levels of government spending and continuing high levels of national income and production, and it is logical that taxes should be cut at some future time," said Mr. Snyder. This was the first intimation of a disposition on the part of the Truman administration to go along with Congress on a tax cut in the foreseeable future.

The Treasury, said Mr. Snyder, now is working on a study out of which it will be prepared to recommend tax law revisions early next year. In general, he said, the Treasury recipe for a sound tax policy is: 1—It should produce adequate revenue; 2—it should be equitable in its treatment of different groups; 3—it should interfere as little as possible with incentives to work and to invest; 4—it should help maintain the broad consumer markets that are essential for high-level production and employment.

Some of the special problems the Treasury Department is studying, said Mr. Snyder, are:

Whether present treatment of tax-exempt organizations discriminates against taxable enterprise.

Whether the present system of depreciation allowances is too rigid.

Whether double taxation is involved in the present method of taxing dividends.

Whether an upward adjustment should be made in personal exemptions to take account of higher living costs.

How to remove inequalities resulting from split-income returns in community property states.

Whether special credit for earned income should be reinstated.

The Treasury study also is looking at excise taxes "with a view to reducing or eliminating those which are extremely regressive, which enter into business costs, which are unduly burdensome on profits of particular industries, or which are unusually difficult to administer."

OTS Denied Appropriation

A House-engineered economy that is of interest to business is the knocking out of the Commerce Department's Office of Technical Services. The House denied entirely the OTS request for $3,400,000 for fiscal 1948. In the expectation that the Senate will approve this House economy, the OTS is acting to dismiss its 663 employees and have all its records in storage by June 30. The staff of 250 who were to finish up the German program has been liquidated.

How much of a loss this move will mean to American industry is a matter for controversy in Washington. OTS officials point out that American industry has purchased from it some 350,000 copies of approximately 100,000 documents so far made available. Orders, they say, continue to come in at the rate of about 1000 daily. They think it will be a distinct loss that they cannot complete some 100,000 more reports on German industrial secrets for which they have collected data.

This point of view received support from Russian Foreign Minister Molotov at the recent Moscow conference. Molotov set at $10 billion the value of technical information collected in Germany by the United States. When Secretary Marshall offered to turn over all this information to the Russians in return for the information obtained by the Russians in their zone, Molotov was not interested. As a matter of fact, the Russians had nothing whatever to gain from such an exchange, since they already, under the generous policy of the United States, have been able to purchase copies of all reports issued by the OTS—and they have been one of the best customers of the Commerce Department's branch.

The OTS view about the losses that will result from failure to complete the present costly program are not shared by industry representatives in Washington. The latter point out that all interested Americans have been able to go to Germany and make detailed inspection of German manufacturing plants in the American and British zones. Many hundreds of our technical men have gone over there and have seen everything there was to see. As a result, industry spokesmen feel, liquidation of the OTS will not prevent American industry from benefiting from full knowledge of German industry.

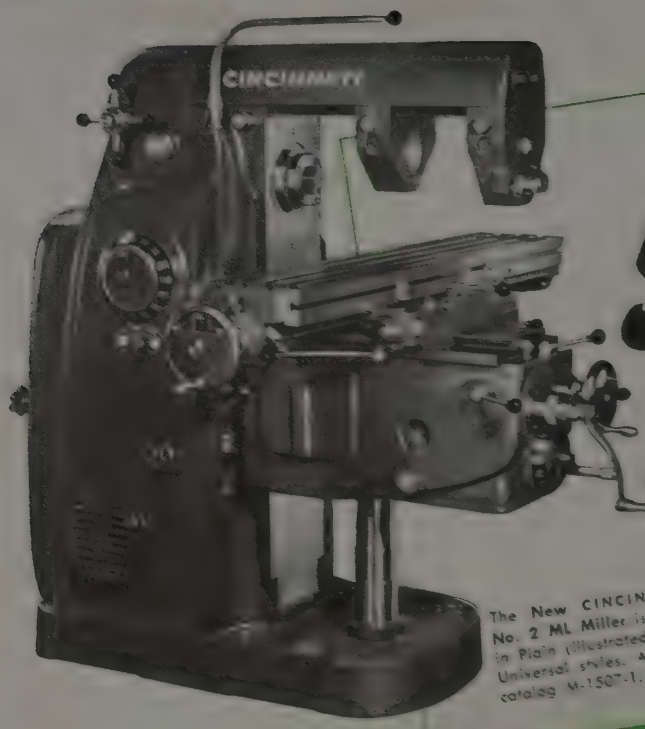
With the liquidation of the OTS will go another of Henry Wallace's pet projects under which the OTS was to have screened all inventions to determine their utility in helping business in the United States to maintain a high volume of employment during the years of peace. The Wallace proposal won wide disapproval on the basis of fears as to what might happen to the country's economy if the Commerce Department, under Mr. Wallace, were to be set up as the judge as to what products American industry should manufacture.

Dirty Coal Is Problem

Tied in with the current negotiations between the coal operators and Mr. Lewis is the dirty coal problem. This has brought complaints from many consumers, who, like the gray iron foundries, require quality fuel for efficient conduct of their business.

The prevailing high ash content of much foundry coke is due to a large extent to the present record-breaking demand for coal—it is running between 12.5 and 13.2 million tons weekly. In the haste to get out production much unclean coal is loaded at the mines. Furthermore, existing cleaning equipment is so badly overloaded that it cannot perform efficiently.

Many operators would order more cleaning equipment if the miners could be depended on to work continuously. To make the heavy investment worthwhile, operations on the basis of 12 months a year must be assured. If production is to be interrupted again by a strike every few months, then the financial gamble will not be attractive to the operators.

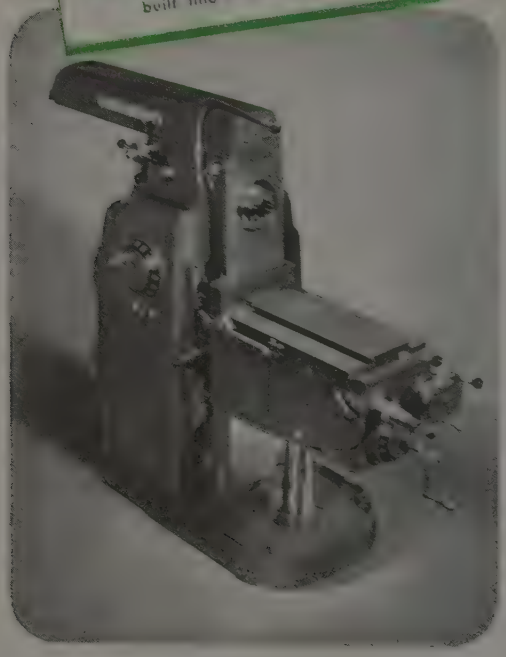


The New CINCINNATI No. 2 ML Miller is built in Plain (illustrated) and Universal styles. Ask for catalog M-1507-1.

5 REASONS

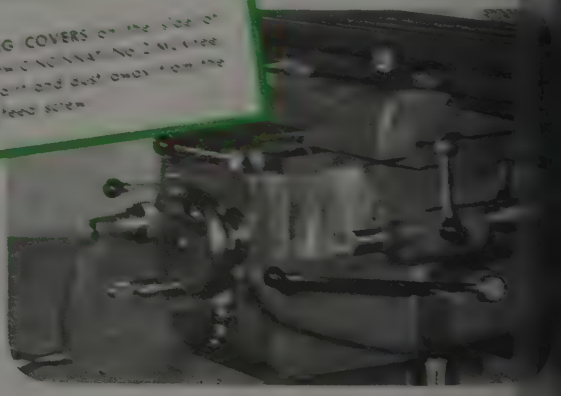
FOR THE LONG LIFE AND CONTINUED ACCURAC OF THE NEW CINCINNATI NO. 2 M

HEAVY KNEE with APRON EXTENSION maintains accuracy of cross and vertical alignments. Hand-scraped bearing surface of the column is kept clean by a wiper built into the top of the apron.



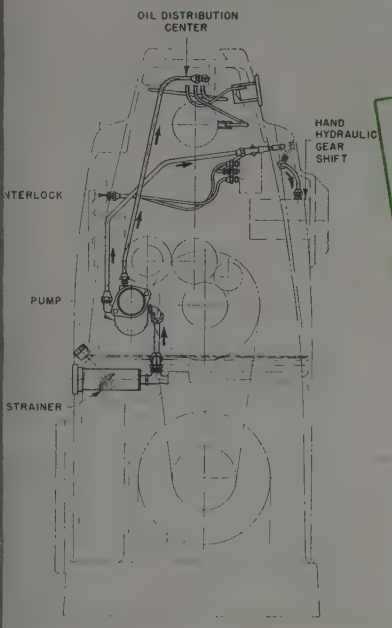
• The formula for useful longevity is about the same for both men and machines. For the New CINCINNATI No. 2 ML, the formula is evident by the features illustrated. ¶ First of all, the machine has a rugged framework which maintains accuracy of alignments while taking cuts up to the capacity of the 3 h.p. motor within the column. To this sound beginning, add the regularity of habits enforced by the features shown here, and you have a machine which will always be on the job . . . for years to come. ¶ The CINCINNATI No. 2 ML, companion to the popular No. 2 MI, has many other features, too, which make it an ideal milling

SLIDING COVERS on the side of the New CINCINNATI No. 2 ML knee keep dirt and dust away from the cross feed screw.

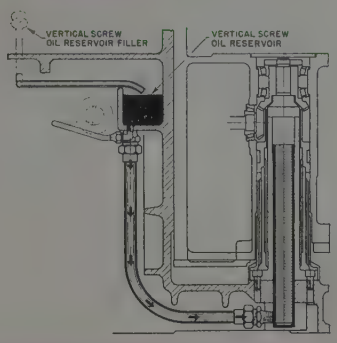


THE CINCINNATI MILLING

MILLING MACHINES

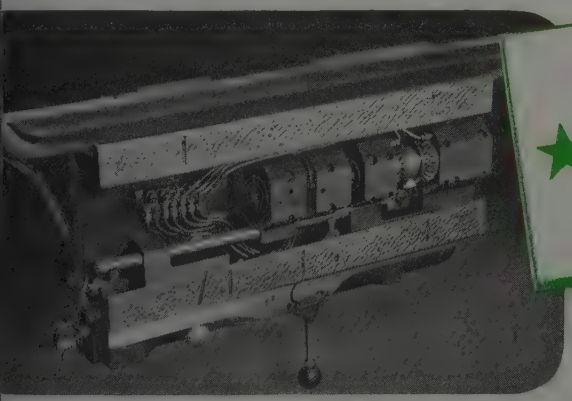


SPINDLE DRIVE LUBRICATION. Gears and bearings don't wear, because lubrication is automatic. And it's no trouble to clean the oil strainer.



VERTICAL SCREW LUBRICATION. Regardless of the up and down movement of the knee, the vertical screw is always in a bath of oil.

achine for cost-conscious shops of all kinds, from nall repair shops to toolrooms of the high production dustries. Spindle speeds are changed with a single ank type control throughout their entire ratio of) to 1. Sixteen feeds, from ¼" to 30" per minute, are so changed with a single crank type control. Many her features offer lower milling costs throughout the ng, useful life span of the New CINCINNATI No. 2 ML. These machines are built in Plain and Universal yles. Many attachments are available for both. We ıall be glad to send you a copy of catalog M-1507-1 hich contains complete specifications.



Right: **LUBRICATION** of all Saddle Parts and Table Ways is accomplished with a few strokes of this conveniently located plunger pump.

Left: The **No. 2 ML SADDLE** (top view) shows arrangement of lubricating lines to vital bearings.

CINCINNATI

MACHINE CO. CINCINNATI 9, OHIO, U. S. A.

BROACHING MACHINES • CUTTER SHARPENING MACHINES

West Coast Firms Get Orders for Arabian Pipeline

Consolidated Steel to make 1000 miles of 26 and 30 in. pipe. Desert motor trucks being built by Kenworth firm

WEST Coast steel and equipment manufacturers will supply much of the materials and machinery for one of history's greatest engineering projects—the trans-Arabian pipeline system.

The line, stretching from the oil fields of Saudi Arabia to the Mediterranean, will be 1000 miles in length. Modern refineries will be constructed to process the crude petroleum into usable oil products. What makes the project's magnitude even greater is the fact that all equipment, supplies and construction tools must be transported great distances from the U. S. to Arabia. Because of climatic and other conditions, it will be necessary to evolve new types of machines.

In the Arizona desert last week huge 6-wheel-drive trucks were tested under conditions similar to those the trucks will meet in the Arabian desert. The trucks will be used to haul pipe. They were built by Kenworth Motor Truck Corp., Seattle.

In the Arizona tests, the trucks, first of 77 ordered by Arabian-American Oil Co., were put through grueling trials. They are designed for sand and high temperature operations. In order to operate under temperatures as high as 125 to 130 degrees, the trucks are equipped with radiation capacity twice the size normally used in the U. S.

They are 2 ft wider than the biggest trucks now in use in this country, and are equipped with 300-hp engines. They have two transmissions and a transfer case for required range of speed and transmission of power for the 6-wheel drive. The order, which is expected to be completed early next fall, totals $2,250,000.

Consolidated Steel Corp. also is planning to begin fabricating pipe for the Arabian project in September. That company's pipe plant at Los Angeles has been expanded to add facilities for making the pipe.

Consolidated holds an order for 1000 miles of pipe, 26 and 30 in. in diameter. The pipe will be of welded steel, made from plates rolled at the Geneva Steel Co. in Utah.

At a directors' meeting of Arabian-American Oil Co. in San Francisco a few days ago, seven bids for transportation of pipe, construction machines and materials and refinery equipment from the U. S. to Arabia were considered b officials of the company. It is expecte that a shipping contract will be awarde soon.

This shipping contract, which will r quire 30 to 40 full shiploads before com pletion, will run into millions of dolla and will be one of the largest sing shipping contracts ever signed in th country.

Scrap Shortage Acute In Western States

West Coast industry is facing the wor shortage of scrap iron and steel sinc 1942, according to H. W. Christensen general purchasing agent of Columbi Steel Co.

Mr. Christensen is chairman of th Northern California Foundry & Scra Industries Committee for Expediting Iro & Steel Scrap.

"Present collections of scrap are no sufficient to meet demands of the stee and foundry industries," Mr. Christense said.

Other members appointed to serve o the scrap committee are R. E. Kroech purchasing agent of Enterprise Engin & Foundry Co.; Marshall Shapiro, pres dent of California Metals Co.; E. W Thomas, manager of purchases for Beth lehem Pacific Coast Steel Corp. an Harry Dull, manager of Moore Machiner Co.

STEEL TOWN: The housing shortage caused United States Steel Corp. to buy the wartime town of Dragerton, Utah, so that employees in the Geneva coal mine might keep their homes. The town, which includes 604 homes, a theater, shopping center, postoffice, school building, church, hospital, clinic, fire department and water and sewage facilities, was purchased from the War Assets Administration for $1,553,000. Homes will be rented to occupants and new employees for the time being and later offered for sale. The town will be organized as a municipality under Utah laws and the public services, school and church transferred to public ownership. The town was built in 1942-43 by the Defense Plant Corp.

Steel Shortage Is Severe Obstacle to British Metalworking Plants

Even companies on priority lists for supplies cannot obtain steel tonnage they need. Attempts being made to increase imports of finished steel, particularly from America. Automobile makers find it necessary to delay delivery dates

BIRMINGHAM, ENG.

MOST METALWORKING plants in Britain are still suffering severely from the insufficiency of steel. Even those on priority lists for supplies cannot obtain the steel tonnage they need.

While the increase in April iron and steel production over February and March provided some encouragement, there still had to be faced the fact the April steel output was at the annual rate of 12,294,000 tons compared with 13,110,000 tons a year ago and the pig iron production was at the annual rate of 7,238,000 tons compared with 7,732,000 in April, 1946.

Some idea of the steel production lost in February and March because of the fuel shortage was given in the House of Commons where it was stated the loss in Sheffield was 70,000 tons.

The serious shortage of semifinished steel is likely to be noticed for some time. To alleviate this situation, attempts are being made to increase imports, particularly from America. Great Britain is getting only a fraction of the tonnage she imported before the war, yet demand for finished products is on an unprecedented scale. Automobile manufacturers are short of sheets, with the result that delivery dates have fallen back considerably since the fuel crisis.

Iron and steel producers are endeavoring to overcome effects of a reduced fuel ration. Some conversion to fuel oil has taken place and the results are so satisfactory that other projects of a similar nature are being speeded up. Plans are also afoot for the more extensive use of electric steel furnaces, although it will be some time before these schemes mature. Output of coal under the new regime of the five-day week has been even better than anticipated, so when quotas are reviewed at the end of the halfyear, bigger allocations of fuel may be made to the iron and steel trade.

The shipbuilding industries are said to be getting only 50 per cent of the normal supply of raw material at a time when the aggregate tonnage on the order books is greater than it has been for many years.

Complicating the situation is the lack of rail transport. British railroads suffered severely during the war, and lost a vast quantity of locomotives and rolling stock, with the result that today a tremendous tonnage is being held up in steelworks because of a lack of transport. Road transport is being used to an increasing extent but all manufacturers of commercial motor vehicles have backlogs of a year or more.

Latest returns of production of iron ore show a drop from 218,000 tons per week to 146,400 tons. Seven blast furnaces have been laid idle this year and others were on slack blast during the fuel crisis. Pig iron production has dropped 17 per cent, causing reduced output of steel and a decline in the make of foundry iron of over 5000 tons a week. The latter has reacted at the works making light castings. In the Midland area there is a very big trade in light castings for the building trade but housing has not gone ahead during the last few months as was anticipated, one of the bottlenecks being the inability of foundrymen to deliver their products.

French Auto Output Hits New Post-Liberation Peak

Automobile output of French factories in March set a new post-liberation record. While the monthly average of 6137 passenger cars produced in March was only 40 per cent of the 1938 monthly average, the truck production of 6419 units was 197 per cent of the 1938 monthly average. The March output of passenger cars, most of which were for export, was up considerably compared with February's production of 4909.

Monsanto's U. K. Subsidiary Finances Expansion Program

Plans for financing an expansion program by Monsanto Chemicals Ltd., British subsidiary of Monsanto Chemical Co., have been announced by the parent company. Approximately $1,600,000 will be used to redeem preferred stock outstanding and the remainder will be used to defray costs of constructing the British firm's new Newport works and other projects. Monsanto Chemical Co. has retained 80 per cent of the common shares in the subsidiary.

British Engineering Group Absorbs Automotive Men

Merger of the British Institution of Mechanical Engineers and the Institution of Automobile Engineers was recently effected, with the IME creating an Automobile Division composed of IAE members. The new division will have a large degree of autonomous life, its affairs being managed, under the general direction of IME's council, by a council elected by the division's membership.

Tata Iron & Steel Co. Institutes New Wage Structure for 40,000 Employees

JAMSHEDPUR, INDIA

A NEW WAGE structure for the 40,000 employees of the Tata Iron & Steel Co. Ltd. has been set up. Under the plan, graded incremental time scales of pay for every occupation and a bonus structure superimposed on the graded basic wage structure are provided.

The performance bonus will vary from 10 per cent at minimum to over 100 per cent of the basic wages according to the per capita performance of the employee. To measure per capita performance from month to month, employees are divided into more than 800 groups. At the end of each month the per capita performance of each group is measured and the percentage of performance bonus payable is determined. At the average performance this bonus is expected to be about 50 per cent in the case of production personnel and 40 per cent in the case of maintenance employees.

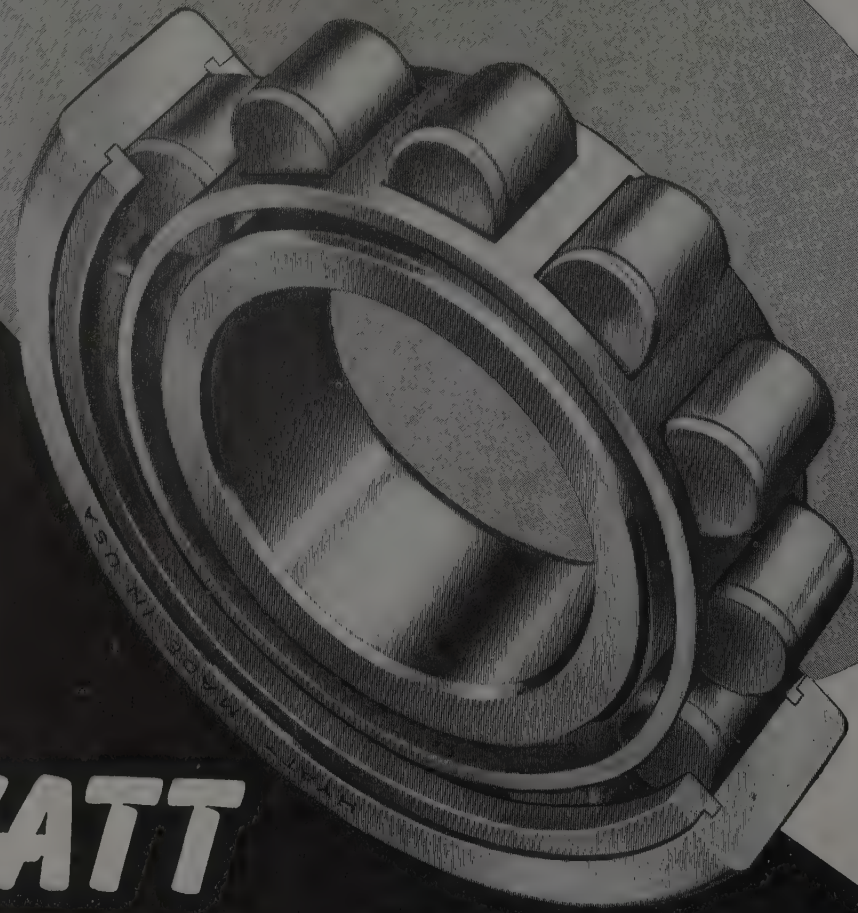
In addition employees other than the supervisory staff will be paid a good attendance bonus of 10 per cent of their basic wages or 20 per cent when they are not entitled to the performance bonus. Aim of this new bonus scheme is to relate the bonus earnings of the individual employee as closely as possible to his contribution to production.

A permanent Joint Rates Committee of two representatives of the steel company, two union representatives, and the director of personnel as chairman has been set up to review cases brought before it by the union concerning changes in designations, changes in the point ratings of jobs, and other matters.

Where Robust Rollers Count

Carrying the loads as they reduce friction—improving performance while they prolong machine life—increasing efficiency and decreasing maintenance—all of these advantages go with the application of Hyatt Roller Bearings.

Builders of better machinery and equipment in the automotive, agricultural, industrial and transportation fields have known the dependability of Hyatt precision and performance for more than half a century. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.



HYATT

ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Foremen's strike at Ford Motor Co. may result in creation of new class of supervisors, called plant engineers, to handle foremen's jobs. Could mean elimination of foremen as such in the future. Near-normal production maintained despite walkout

DETROIT

STRIKING Ford foremen, several thousand of whom walked off their jobs May 21, conceivably could provide the necessary push to move the Senate Labor Bill through speedy passage and a presidential O. K. which otherwise might not have been so likely. The company was able to maintain near-normal production, since UAW-CIO members showed no hesitancy in walking through foremen's picket lines and sufficient numbers of supervisory personnel were hastily recruited to keep operations going. One report was to the effect the company was considering organizing an entirely new supervisory force to handle foremen's jobs, the men to be called plant engineers. This could mean elimination of foremen as such in the future.

UAW-CIO workers were ordered not to accept any upgrading to the foremen level, so it is probably necessary to draw new supervisors from the assistant superintendent and superintendent class, process control forces and others not affiliated with the UAW-CIO. An early difficulty which did develop was the refusal of AFL truck drivers to haul incoming freight shipments into the plant by motor truck. This was circumvented by transferring such freight to nearby railroad warehouses and moving it into the Rouge by rail.

Foremen's Attitude Hard to Understand

It is difficult to understand the arbitrary action of Ford foremen in view of the particularly conciliatory attitude of the management, from Henry Ford on down. An offer was extended to renew the old contract with foremen, even after it had been suspended on May 9. Mr. Ford and John S. Bugas, vice president in charge of industrial relations, met with the executive committee of the FAA to make the offer, which was brusquely rejected.

Mr. Ford followed with a letter to all foremen explaining the company's offer, declaring in part, "We agree that there is much to be done in clarifying the status of our foremen—particularly in the direction of making them a more effective part of management. Specific steps have already been taken in this direction, as most of you know. Long-range programs have been planned, some of which are now ready to be put into effect. The goal of all these things is to help foremen toward better jobs and greater security through more responsibility. Past mistakes and bad habits cannot be corrected overnight. Patience and hard work, together, are required. That road of better understanding and closer co-operation is the one we want to take."

The FAA appeared determined to effect a closing of the entire plant. After initial failure to do this, it was announced all foremen would be called out of the Rouge power house, where an exception to the walkout had been permitted by the union. Tieup of a key unit such as this might prove a tough one for the company to handle. Likewise in the continuous-operation departments, such as blast furnaces, coke ovens, open hearths and rolling mills, the problem of maintaining supervision is critical.

In the first days of the strike, Ford assemblies were on a par with those of preceding days, except for a slowing down of Mercury production resulting from a strike at a frame plant of Murray Corp. of America. The latter trouble sprang from efforts to force a 15-cent hourly increase in wages. The UAW-CIO local at the frame plant decided since the company would not act on the wage boost, which amounted to roughly 8 per cent, it would slow down production by this amount. After this was done, the management suspended the offenders and as a result all operations finally had to be stopped. The dispute was adjusted in a matter of days and frames began rolling again to the Mercury line.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Estimates by Ward's Automotive Reports

	1947	1946
January	373,872	126,082
February	399,717	84,109
March	442,242	140,738
April	449,228*	248,108
May	392,100*	247,620
June		216,637
July		331,000
August		359,111
September		342,969
October		410,510
November		380,664
December		380,908
12 ms.		3,268,456

* Preliminary.

Estimates for week ended:

May 10	94,756	71,355
May 17	83,201	48,565
May 24	96,408	53,020
May 31	78,000	33,895

Dealer Backlogs Heavy

Talk of new passenger car models always freshens in the spring, and this year is no exception despite the absence of anything much resembling spring. While the industry obviously is moving ahead with experimental and development work on new engines, new bodies, new springing systems and a host of other matters, it might be well, before anticipating any imminent changes, to consider results of a survey just completed by the National Automobile Dealers' Association. It covered dealers in 68 cities and towns in all sections of the country, and is based upon a sampling of 373,912 new car orders they had received up to March 31.

Of all orders received by dealers since new car production was resumed, the survey shows only about 30 per cent have been delivered. The result is that, after all deliveries and cancellations for all causes are accounted for, the number of orders still on hand is almost double the number of cars these dealers expect to receive from manufacturers during the balance of this year, assuming of course, production will continue on the present level of around 100,000 cars and trucks weekly.

Many dealers reported they stopped taking orders last fall because they had more on their books than they knew could be filled within any reasonable period. Now that many dealers have resumed order taking, because of the pressure of customer insistence, and despite the number of cars delivered in the meantime, they find they now have a greater number of orders on hand than they did last fall.

Cancellations for all reasons have been but a fraction of the total orders received—approximately 16 per cent in over 18 months. Most of these occurred in 1946, buyers giving the reason "they were tired of waiting for a new car." Cancellations reported in the first three months of this year are the lowest of any quarter reported.

One thing apparently not reported in

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FOREMEN ON STRIKE: Walkout of 3700 foremen at the Ford Motor Co. gave rise to reports the company may create a new class of supervisory employees, called plant engineers, to take over the duties handled by foremen. This would place the supervisors definitely in the management class. Above, striking foremen are shown picketing. NEA photo

the dealer survey is the number or duplications in ordering between dealers handling different makes of cars. Many observers believe this figure is high, particularly in view of the fact new cars can be peddled by owners immediately after purchasing at several hundred dollars more than they paid. The point is, however, there is little incentive for manufacturers to push new model development and tooling as long as impatient buyers in the above number clamor for cars. An early changeover further would seem to be poor policy in view of the extreme cost of new tooling, the large amounts of money already spent in excess of budgeted amounts for plant reconversion and elimination of production bottlenecks, and the loss of production which a shutdown would entail.

Changes in the Making

Still there is no lack of discussion about what is coming in new passenger cars, the timing is the debatable factor. New bodies are in the works for the larger Buick, Cadillac and Olds models, and should the competitive position require it, extensive changes could be introduced in bodies for the intermediate-size General Motors lines. Engine specialists in GM divisions, as noted here in previous weeks, are testing new power plants of various designs, particularly in the V-8 field. A wire service report released recently mentioned the possibility of "hydraulic tappets which would eliminate camshafts" as a possibility in new engines. These things come slowly, if at all. There must be time for testing and retesting, as well as proving in all types of climates and geography. If there are any appreciable engine changes in 1948 models, whenever they emerge, it will surprise many onlookers here.

Ford has been busy on new passenger car evolution, and it is a certainty the new Ford-Mercury-Lincoln lines will mark a complete break from past Ford tradition. There is a new crowd in the saddle, and many of the preconceived Ford notions on engineering and design are being unceremoniously tossed out the window. Yet only a few weeks ago, Mr. Ford told a Washington audience his company would have no new models this year.

Chrysler new models are a big question mark. Engineers have been experimenting there for years on a new V-8 engine, but its status at the moment is as vague as the placement of new tools and dies for bodies.

Packard already has its new models in production, and there will be at least two or three more in the series by September. After the radical changes Studebaker made last year, it is unlikely to expect any major restyling there before the 1949 models.

Hudson is rumored to be fairly well set on a new series of passenger cars, probably keeping a close eye on the competition.

Nash has some tooling in the works, principal reported change being adaptation of the integral-type of body and frame construction, used in the 600 model, to the larger ambassador models.

Willys-Overland is using just about all the steel it can get in jeeps, station wagons, and a new line of trucks and panel delivery cars. Its new 6-cylinder passenger car still is scheduled for production, probably some time next year.

Willys Reports Profit

The Willys financial statement for the six months ending March 31, suddenly recalled after its first issuance, now is official and shows consolidated net profit after taxes of $1,164,886, on sales of over $64.4 million, the highest profit for a similar six-month period since 1945, and the greatest six-month net for a peacetime year since 1928. The company built 77,988 units in 1946 and 28,855 in the first three months of this year. It passed the 100,000 mark in civilian jeep models alone. Since resuming peactime production, 27,586 jeeps and station wagons have been exported. All profit shown thus far this fiscal year, except preferred stock dividends, will be returned to the business. A new $5 million pressed steel shop, with a complement of 53 presses, is expected in operation inside of 90 days.

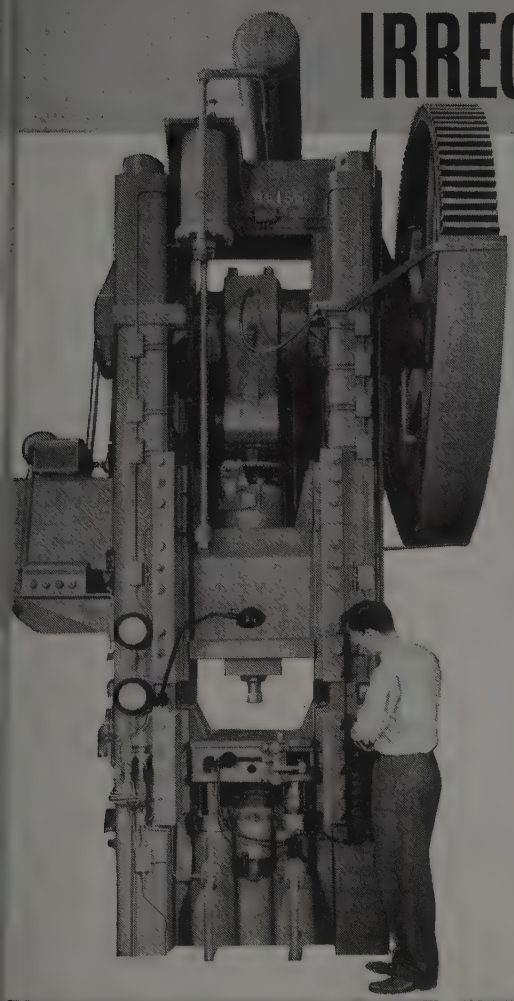
Front-Drive Dormant

The novel front-drive Kaiser passenger car, which failed to pass its preliminary engineering tests, and hence was put back on the shelf, is still dormant from all indications. The company would have been foolish to press this project as long as it was losing money hand over fist on productoin of the conventional Kaiser and Frazer cars. Now that black ink is emerging on balance sheets, a reconsideration of the early Kaiser design may be in prospect. The fact "Kaiser men" have been moving into a greater degree of control at the Willow Run plant might suggest this, since the front-drive vehicle was always more one of their pet projects than it was of the Frazer crowd.

Another Year of Adjustment

Alfred P. Sloan Jr., chairman of General Motors Corp., told stockholders last Tuesday at the corporation's thirty-ninth annual meeting, that it will require another year and probably longer before GM can feel assured economic adjustments resulting from the war are properly reflected in the operating position on a going basis, in terms of operating efficiency, costs, selling prices, business volume and other factors. He added that in terms of volume, General Motors' prewar might have been looked upon as a business with annual volume of less than $2 billion. Postwar it has become a $3 billion plus business, and at capacity operations and present prices yearly aggregate would be in excess of $4 billion. He forecast operations at capacity levels well into 1948.

NEW BLISS BRIQUETTING PRESS EXTENDS METAL POWDER APPLICATION TO LARGE, IRREGULAR CROSS-SECTIONS



Complex powder metal parts beyond the size range and capacity of available single-action mechanical or hydraulic presses can now be produced to close tolerances in this new Bliss No. 309 Briquetting Press. Developed in cooperation with a large powdered metal parts fabricator, the press employs a unique operating principle which combines the advantages of triple hydraulic lower motion—floating die table, core rod and stripper—built into a 345-ton mechanical press.

Uniform density throughout the finished part is assured by the hydraulically controlled floating die table and core rod rams which recede against pre-determined pressure by simple, independent adjustments. This has the effect of squeezing the powder from the top and bottom. Many combinations of the three lower motions are made possible by flexible electric timing devices. Table and core rod can be kept stationary if desired. A variable speed motor and two-speed gearing provide 6 to 18 strokes per minute.

Once set up, the press is easy to operate. A hopper feed arrangement automatically fills the die and ejects the previously finished piece.

Tell the nearest Bliss sales representative about your metal powder equipment needs. Recommendations will be made without obligation.

E. W. BLISS COMPANY, DETROIT 2, MICHIGAN

Mechanical and Hydraulic Presses, Rolling Mills, Can and Container Machinery

WORKS AT: Brooklyn, N. Y.; Toledo, Cleveland, Salem, Ohio; Hastings, Mich.; Derby, England; St. Ouen sur Seine, France • SALES OFFICES: Detroit; Brooklyn; Cleveland, Dayton, Toledo, Ohio; Lansing, Mich.; Chicago; Philadelphia, Pittsburgh, Pa.; Rochester; New Haven; Boston; Toronto.

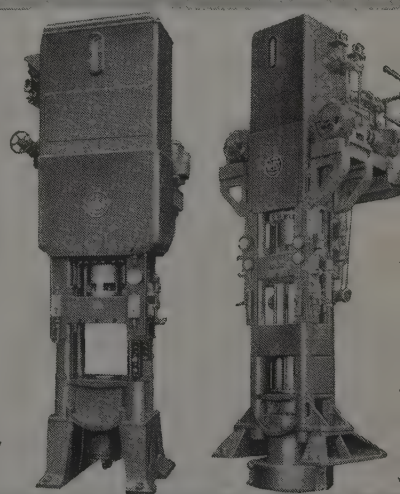
SPECIFICATIONS

	CAPACITY	STROKE*
Slide	345-ton	10"
Core Rod	60-ton*	3¼"
Stripper (eject up)	75-ton*	6"
Die Table	120-ton*	3"

*adjustable

Bliss also builds other special multi-action hydraulic presses for metal powder products. Shown here are two 200-ton presses: one a single action machine, equipped with hydraulic ejector, and the other a duplex press which provides simultaneous squeezing by two slides with independently controlled speeds and adjustable pressures. Lower slide also acts as an ejector.

SEND FOR COPY OF *"PRESSES FOR POWDERED METAL PRODUCTS"*



BLISS BUILDS MORE TYPES AND SIZES OF PRESSES THAN ANY OTHER COMPANY

STAY AHEAD WITH *Bliss*

Safety Stressed In Bethlehem's Employee Report

Includes comparison between earnings, payroll, employment since 1926. Greater productivity seen needed

CONTINUING a practice it began 20 years ago, Bethlehem Steel Co., Bethlehem, Pa., last week published its annual report to employees. The report, comparable to that to stockholders, outlines the company's progress in the 20-year period and explains its aims in the future. According to E. G. Grace, chairman, the company will undertake a continued program of plant improvements with every engineering and scientific development "being considered for its applicability to low-cost, high-quality production."

During the past 20 years, Mr. Grace said, company receipts, employment, average hourly earnings and payroll more than doubled. In contrast the company's profit margin contracted. "The net income in 1926 was 6.7 per cent of the money received for goods and services, whereas in 1946 the figure had dropped to 5.3 per cent," he said.

Any developments such as improved production processes which can keep steel prices down, he continued, "will add to our markets, to employment and to the service we render the nation. . . . More production per man is the solution for improved national income and a higher standard of living. Some of this increased production can be achieved through better plant facilities, better planning, new processes; but the individual effort must be there also," he asserted. "Only through the most alert and devoted effort of management and employees can any industrial company make progress today under the conditions of high costs."

Emphasizing the results of the company's safety program, the report declared accident frequency in 1946 reached an all-time low, 64 per cent below the 1926 rate and 84 per cent under 1916, when an organized program was begun. In Bethlehem coal mines, the report said, "accident frequency and severity . . . . were respectively 60 per cent and 29 per cent better than the averages for the industry for the previous year," and added "inspection of the mines is a daily practice, virtually continuous in extent."

Detailing the operation of its pension plan and relief programs for sickness, accident and death benefits, the company's report also contained a comparison of financial statistics between 1926 and 1946, review of important acquisitions and improvements and new products during that period, and plant additions which are under construction now. It also contained reprints of some of the material published in the first report to employees.

OFFICERS STUDY BEARINGS: Army and Navy officers, being trained together at the Industrial College of the Armed Forces in economic mobilization methods, visit SKF Industries Inc., Philadelphia, for first-hand study of precision ball and roller bearings used in virtually all types of military machines. Mrs. Ann Mathas, inspector, shows precision spheres to Navy Capt. A. M. Grannum, Lt. Col. Thomas H. James and Col. H. J. Kieling

Heating Equipment Firm Buys Cicero Plant for $361,000

War Assets Administration, Chicago, has sold the surplus plant at 1855 S. 54th St., Cicero, Ill., to Hess Warming & Ventilating Co., Chicago, for $361,674.69. Operated during the war by Strom Steel Ball Co. for production of bearings, the plant has approximately 57,000 sq ft of floor space which will be converted for the manufacture of heating equipment.

Morse Chain Reaches Peaks In Production and Sales

Peacetime peaks in production and sales were reached in April by Morse Chain Co., Ithaca, N. Y., according to a recent report from F. M. Hawley, president of this division of Borg-Warner Corp.

In April the company produced over 300,000 automotive timing chains. Current backlog of unfilled orders as of May 1 well exceeds the firm's total sales for the years 1939 and 1940 combined. The company's rehabilitation program, now about 75 per cent completed, involves a total expenditure of over $2,100,000 at the Ithaca, N. Y., and Detroit plants. This sum is being spent mainly for machine tools and dies.

Morse Chain sales in April were double those of the biggest prewar month in the company's history. Sales for the first four months of 1947 showed an increase of 26.5 per cent over the corresponding period of 1946.

Two New Chapters Formed In Foundry Association

Two new chapters of American Foundrymen's Association, for British Columbia and Central Michigan, have been approved. The British Columbia Chapter, third in Canada, will have headquarters at Vancouver. Norman Terry, secretary-treasurer of Canadian Sumner Iron Works Ltd., Vancouver, heads the organizational committee.

The Central Michigan group will have headquarters in Marshall, Mich., and Douglas J. Strong, president of Foundries Materials Co., Coldwater, is organizing committee chairman. With these two additions there are now 88 chapters in the association.

RIEFS . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Winchester Repeating Arms Co., New Haven, Conn., division of Olin Industries Inc., manufacturer of sporting arms and ammunition, will shortly begin making small dry cell batteries for miniature radios and hearing aids.

—o—

Talon Inc., Meadville, Pa., manufacturer of metal fasteners, has purchased Wilson Fastener Co., Cleveland. The Wilson plant will be kept in operation as a Talon subsidiary. Harold W. Soles will be in charge in Cleveland.

—o—

Advance Steel Co., Cleveland, steel jobber, has purchased a 1-story building on Meech Ave. in an expansion move.

—o—

Elyria Spring & Specialty Co., Elyria, O., newly formed, expects to begin production July 1 of springs, wire forms, metal stampings and allied products.

—o—

Yankee Precision Products Co., Hartford, Conn., designer and builder of electronic and mechanical gages, tools and equipment, has consolidated with Modern Tools, Berlin, Conn. Offices and manufacturing facilities will be located in the Berlin plant. Modern Tools will continue operation as a division of Yankee.

—o—

Hewitt Rubber Division, Buffalo, Hewitt-Robins Inc., has announced it is active in producing Maltese Cross conveyor and elevator belting, withheld from manufacture during and since the war.

—o—

Timken Roller Bearing Co., Canton, O., has opened a branch plant at St. Thomas, Ontario, Canada. The project was originally started in May, 1945.

—o—

Commercial Shearing & Stamping Co., Youngstown, has purchased for $182,300 government-owned facilities installed in its plant during the war for the manufacture of bomb casings. When originally installed the facilities cost $380,703.

—o—

War Assets Administration has sold a war-surplus zinc oxide reclamation plant at Ft. Smith, Ark., to Residue Co. for $92,000. Built to reclaim zinc oxide from smelter residue received from other plants, the project was operated during the war and leased since by Residue Co.

—o—

Linn Coach & Truck Corp., Oneonta, N. Y., has been taken over by Great American Industries. Linn will continue to manufacture trucks and panel coaches.

—o—

Pressed Metal Institute, Cleveland, has issued its third edition of *Blue Book of Stamping Manufacturers.* The directory contains an alphabetical list of institute members, a geographical breakdown of membership and facilities of active members.

—o—

War Assets Administration has announced that all bids received for a Dunkirk, N. Y., war plant, built for the production of alloy steel products and operated during the war by Allegheny Ludlum Steel Corp., have been declined as inadequate. The plant originally cost the government $4,638,000 and has a current appraisal of $2,114,300.

—o—

General Electric Co., Schenectady, N. Y., announces that over $255,000 have been awarded in scholarships and loans for educational purposes by the company since the establishment of its first educational assistance program in 1922. There have been 165 fellowships, five scholarships and 139 loans granted.

—o—

William Sellers & Co. Inc., Philadelphia, manufacturer of machine tools, has sold its Philadelphia plant between 16th and 17th Sts. to Harry H. Robinson. The facility consists of several buildings containing approximately 220,000 sq ft of floor area. Machinery and equipment was included in the sale which totaled approximately $1 million.

—o—

Clark Tructractor, Battle Creek, Mich., division of Clark Equipment Co., has designed a fork truck for United Steel & Wire's Battle Creek plant which will unload and handle 100,000 lb of steel wire every 1¾ hours.

—o—

Automatic Transportation Co., Chicago, manufacturer of electric industrial trucks, has appointed T. C. Coleman & Son, Louisville, Ky., as sales representative.

—o—

Hanson-Van Winkle-Munning Co., Matawan, N. J., manufacturer of electroplating, pickling and polishing equipment and supplies, has been awarded a certificate in recognition of its record of having no lost time accidents from Oct. 1, 1946, to Dec. 31, 1946, by the New Jersey State Department of Labor. The company's perfect record was continued through January, February and March, 1947.

—o—

United States Steel Corp., New York, has revealed that western holdings of its stock totaled 675,671 shares of common stock as of March 31, 1947, as compared with 622,990 on March 31, 1946. Holders of preferred stock in 11 western states had 187,967 shares, against 184,624 shares on March 31, 1946.

—o—

Warner & Swasey Co., Cleveland, has developed a textile machine which speeds and simplifies production of woolen yarn. Production is expected at the rate of one a day.

—o—

Ampco Metal Inc., Milwaukee, alloy metal fabricator, has added a series of general purpose centrifugal pumps to its line of bronze products.

—o—

Gerard-Diamond Metal Polishing Co., Washington, Pa., has leased for five years building 66 of the surplus Aluminum Co. of America forging plant at Canonsburg, Pa. The company will pay an annual rental of $1848 and will pay for all utility services, taxes, maintenance and insurance costs on the property which contains 6161 sq ft of floor area.

—o—

M. E. Cunningham Co., Pittsburgh, has developed a metal tagging and tag embossing outfit, designed to provide a permanent method of identifying ferrous and nonferrous billets during storage in yards prior to the rolling operation.

—o—

Chicago Bridge & Iron Co., Chicago, is constructing 68 large storage tanks at its Birmingham plant for hauling propane gas on ships. Believed to be the first large tanks ever to be built for such a purpose, they will be installed on merchant vessels at Beaumont, Tex.

—o—

Tennessee Coal, Iron & Railroad Co., Birmingham, subsidiary of U. S. Steel Corp., will contribute an additional $25,000 to the Southern Research Institute.

—o—

Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., has purchased the surplus steel casting facilities at Birdsboro for $450,000 from War Assets Administration. Property consists of four buildings with a total floor area of more than 127,000 sq ft.

—o—

Vulcan Tool Co., Dayton, O., has developed a hydraulic piercing unit that pierces all holes in the flanges of a refrigerator door in a single seven-second operation.

—o—

International Roll Forming Co. Inc., New York, is requesting the Office of the Housing Expediter for a guaranteed market contract for the manufacture of an aluminum siding for use in residential construction. Contract calls for an output of a million linear feet of the siding per month for six months.

The Business Trend

Industrial Activity Rate Highest Since Month Ago

BEST RATE of industrial activity since the end of April was recorded in the week ended May 24. Due largely to gains in automobile and steel ingot output, STEEL's industrial production index increased 3 points to 160 per cent preliminary of the 1936-1939 average. This is 4 points below the postwar high.

STEEL—Ingot production is back to postwar peak levels, and the outlook for sustainment of this rate is hopeful now that the industry's labor relations picture has brightened and scrap and other raw materials are flowing in volume to the mills.

AUTOS—Resumption of production by one automobile manufacturer which had closed down ten days to build up stocks of components and materials, particularly sheet steel, helped raise total output of passenger cars, trucks and buses in the week ended May 24 to an estimated 96,405, compared with 88,201 in the preceding week. Despite current high production of steel, auto builders likely will hesitate to make any sizable jumps in auto output, lest the bogey of shortages of other essentials. Rather they probably will aim for steady operations. A survey of 875,000 customers' orders in 65 cities revealed U. S. auto dealers have orders for twice as many new cars as they expect to get during the remainder of 1947.

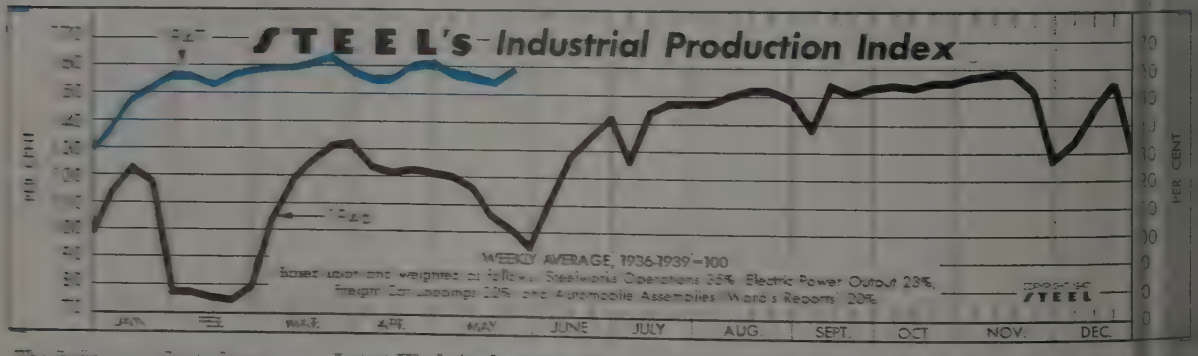
COAL—Output of bituminous coal in the week ended May 17 was 12,970,000 tons, a decline from the preceding week's 13,050,000 tons. However, aggregate production this year through May 17 was 36.6 per cent ahead of that for the corresponding period of last year.

PETROLEUM — Responding to increasing demands for petroleum and higher prices for crude oil, crude output in the week ended May 17 rose to another new record daily average of 5,008,050 barrels. This marks the second consecutive week a new record had been achieved.

PRICES—The first increase in the U. S. Bureau of Labor Statistics wholesale price index since the week ended May 29 was registered in the week ended May 17. Up 0.2 per cent, the index is at 147 per cent of the 1926 average. The increase resulted from slight upward movements in most commodity groups.

RAILROADS—Advance reports from 85 class 1 railroads whose revenues represent 81.6 per cent of total operating revenues indicate railroad operating revenues in April increased 20 per cent over those of the corresponding month a year ago. However, railroad operations in April, 1946, were depressed by coal miners' strike. Volume of freight traffic that month was only 37,41[illegible]864,000 ton-miles, but in April, 1947, it was estimated at 52,200,000,000.

OUTLOOK—Most noticeable in May reports to the National Association of Purchasing Agents is the absence of depression pessimism. A healthful sign, says the association, is the fact an increasing number of sellers are refiguring costs and showing a desire to negotiate business on a realistic selling basis.


STEEL's Industrial Production Index
PER CENT
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35% Electric Power Output 23%, Freight Carloadings 20% and Automobile Assemblies (Ward's Reports) 20%
STEEL
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT NOV. DEC.

The index see chart above: Latest Week (preliminary) 160 Previous Week 155 Month Ago 162 Year Ago 101

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	96.5	94.5	95.5	45.0
Electric Power Distributed (million kilowatt hours)	4,625‡	4,616	4,668	3,942
Bituminous Coal Production (daily av.—1000 tons)	2,162	2,175	2,100	1,492
Petroleum Production (daily av.—1000 bbl.)	5,002‡	5,008	4,930	4,759
Construction Volume ENR—Tot. $1,000,000)	$113.2	$131.3	$88.4	104.2
Automobile and Truck Output (Ward's—number units)	96,405	88,201	102,447	3,020

*Date on request. †1947 weekly capacity is 1,749,928 net tons. 1946 weekly capacity was 1,762,381 net tons. ‡Preliminary.

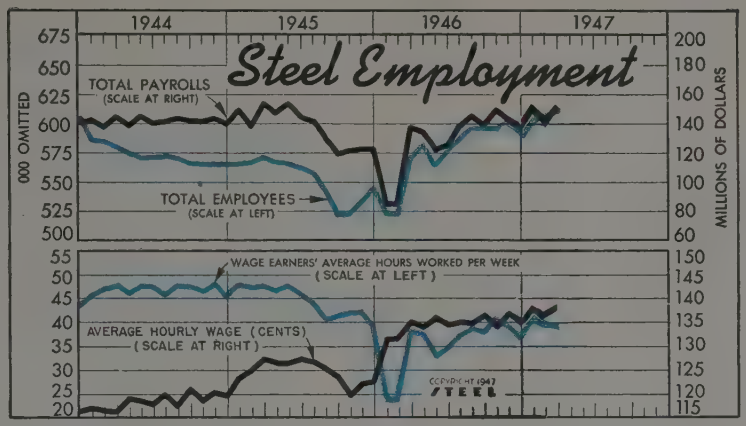
TRADE				
Freight Carloadings (unit—1000 cars)	883‡	888	894	572
Business Failures (Dun & Bradstreet, number)	80‡	88	66	21
Money in Circulation (in millions of dollars)‖	$28,116	$28,134	$28,105	$7,961
Department Store Sales (change from like wk. a yr. ago)‖	+11%	+13%	−6%	+35%

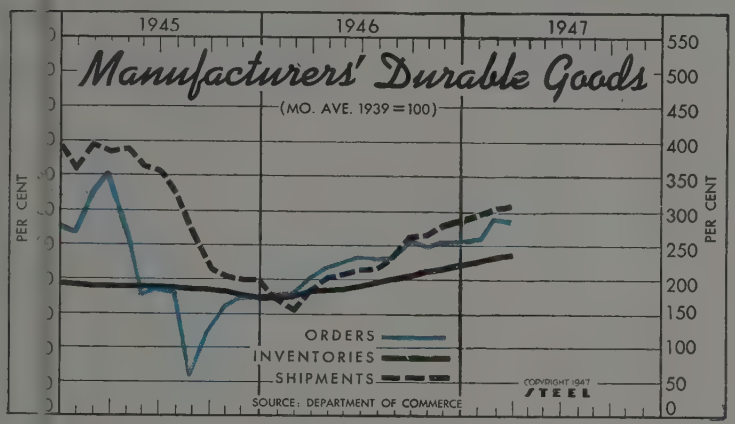
‡Preliminary. ‖General Reserve Board.

Steel Employment

	Employees† (000)		Total Payrolls (millions)		Hourly Wage† (cents)	
	1947	1946	1947	1946	1947	1946
Jan.*	601	522	$155.8	$84.9	138.1	131.4
Feb.*	607	522	139.5	84.9	137.0	131.4
Mar.	609	570	150.6	138.8	137.9	135.1
April	..	582	....	134.3	....	134.1
May	..	563	....	121.4	....	135.8
June	..	578	....	125.6	....	134.4
July	..	585	....	138.0	....	135.1
Aug.	..	596	....	145.2	....	134.6
Sept.	..	596	....	139.6	....	136.2
Oct.	..	596	....	150.6	....	134.1
Nov.	..	600	....	143.4	....	136.7
Dec.	..	594	....	137.2	....	135.2

† Monthly average. * Figures for January and February, 1946, are merely averages derived from report that combined those two strike-affected months.



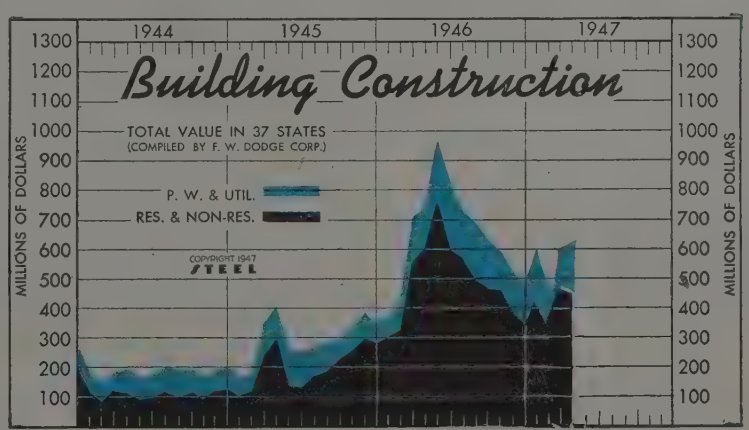


Index of Manufacturers' Durable Goods
(Mo. Ave. 1939=100)

	Orders		Shipments		Inventories	
	1947	1946	1947	1946	1947	1946
Jan.	270	176	292	169	226	171
Feb.	293	179	311	153	232	174
Mar.	285	203	312	183	238	181
Apr.	...	219	...	203	...	182
May	...	224	...	207	...	184
June	...	231	...	212	...	189
July	...	229	...	216	...	195
Aug.	...	232	...	233	...	200
Sept.	...	254	...	259	...	206
Oct.	...	248	...	262	...	211
Nov.	...	254	...	278	...	215
Dec.	...	271	...	292	...	220
Ave.	...	227	...	222	...	194

Construction Valuation in 37 States
(Unit—$1,000,000)

	Total	Public Works-Utilities		Residential and Non-residential	
	1947	1947	1946	1947	1946
Jan.	571.6	113.9	50.2	457.7	307.3
Feb.	442.2	90.5	64.7	351.6	322.7
Mar.	606.8	122.0	143.6	474.8	554.0
Apr.	902.3	161.4	128.1	441.0	606.8
May	....	....	197.9	....	754.6
June	....	....	202.5	....	605.5
July	....	....	153.1	....	564.9
Aug.	....	....	184.4	....	495.6
Sept.	....	....	156.4	....	463.5
Oct.	....	....	112.8	....	460.4
Nov.	....	....	121.8	....	382.0
Dec.	....	....	115.9	....	341.4
Total	....	....	1,631.4	....	5,858.7



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$12,475	$12,171	$12,442	$11,838
Federal Gross Debt (billions)	$257.7	$257.7	$257.9	$273.0
Bond Volume, NYSE (millions)	$22.9	$21.7	$18.0	$19.7
Stocks Sales, NYSE (thousands)	5,657	6,138	4,380	6,338
Loans and Investments (billions)†	$55.0	$55.0	$55.3	$64.1
United States Gov't. Obligations Held (millions)†	$34,506	$34,544	$34,814	$45,871

† Member banks, Federal Reserve System.

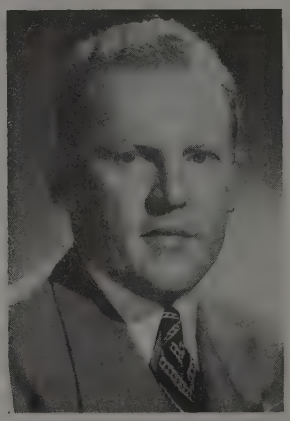
PRICES

STEEL's composite finished steel price average	$69.82	$69.82	$69.82	$63.54
All Commodities†	147.0	146.7	147.2	110.9
Industrial Raw Materials†	160.2	160.1	160.3	124.6
Manufactured Products†	142.2	141.9	142.1	106.1

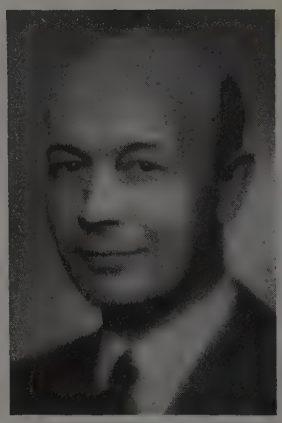
† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

HOWARD H. BLOUCH



ROBERT E. BURNS



C. D. HEPLER

Howard H. Blouch has been appointed to handle sales promotion in the line of chemical proof equipment for the Heil Process Equipment Corp., Cleveland, to devote most of his time to jobber cooperation. He has been associated with electroplating for many years, recently serving as process engineer for the White Sewing Machine Co. and the Van der Horst Corp., Cleveland. He had previously been associated with the Grasselli Chemical and Electrochemical Departments of the E. I. duPont de Nemours Co., Wilmington, Del., for 20 years.

—o—

S. W. Fletcher, president of J. O. Ross Engineering Co., New York, has been elected a director of the Industrial Furnace Manufacturers Association.

—o—

Blair F. Claybaugh, founder and president of the Blair F. Claybaugh Co., Harrisburg, Pa., has been elected a director of the Sterling Engine Co., Buffalo.

—o—

Dennis J. Crowley, formerly with the Steel Casting Division of the American Radiator & Standard Sanitary Corp., Pittsburgh, has been named a special sales representative of Pratt & Letchworth Co. Inc., Buffalo.

—o—

Oscar Frohman has been elected president of the Milwaukee section of the American Society of Lubrication Engineers.

—o—

H. T. Rowe has been appointed advertising manager of International Business Machines Corp., New York. He has been serving as special assistant to **C. A. Kirk,** executive vice president.

—o—

Donald W. Randolph has been elected to the newly created post of vice president in charge of research and engineering of the Apex Electrical Mfg. Co., Cleveland.

—o—

Robert E. Burns has been appointed manager of sales in the St. Louis district for the Bethlehem Steel Co., Bethlehem, Pa. He succeeds **Charles H. Cecil,** who has been appointed manager of sales for the company's Pittsburgh district.

—o—

F. W. Marschner, western sales manager for the New Departure Division, General Motors Corp., Detroit, has been promoted to executive assistant to the general manager of that division. He will have headquarters at the main plant in Bristol, Conn. Mr. Marschner joined the New Departure Division in 1914 as manager of the Detroit office, and was later appointed western sales manager.

—o—

Robert H. Taylor, general sales manager, Florence Stove Co., Gardner, Mass., has been elected vice president in charge of sales.

—o—

Clarence W. Coe has been appointed manager of the new Decatur, Ill., Works of the General Electric Plastics Division, Pittsfield, Mass., General Electric Co., Schenectady, N. Y. He had been manager of the division's plant at Ft. Wayne, Ind., operations of which will be transferred to Decatur.

—o—

Robert A. Miller has been appointed to the research staff of Battelle Memorial Institute, Columbus, O., where he will be associated with the division of industrial physics.

—o—

Charles F. Yarham, formerly with the Euclid Road Machinery Co., Cleveland, has joined the Ohio Equipment Co. which represents the Yale & Towne Mfg Co., Philadelphia, in the Cleveland district.

—o—

C. D. Hepler, vice president, Trumbull Electric Mfg. Co., Plainville, Conn., has been placed in charge of all sales activities of the company. He has been associated with Trumbull for many years, and prior to his election as vice president of the parent company he had been president of the Trumbull Pacific Division, where he was appointed vice president and general manager in 1933.

—o—

W. J. Campbell, welding engineer, General Electric Co., Schenectady, N. Y., will assume duties July 1 as G-E arc welding specialist for the southeastern district, with headquarters in Atlanta. In his new position, Mr. Campbell will cover North Carolina, South Carolina, Tennessee, Georgia, Florida, Alabama, Mississippi, and part of Louisiana.

—o—

W. B. Quail, sales manager, New York district, American Rolling Mill Co., Middletown, O., has been appointed to take charge of sales in the company's central area, which includes Cincinnati, Cleveland and Detroit districts. He will be succeeded at New York by **Robert Barham,** assistant district sales manager, Chicago.

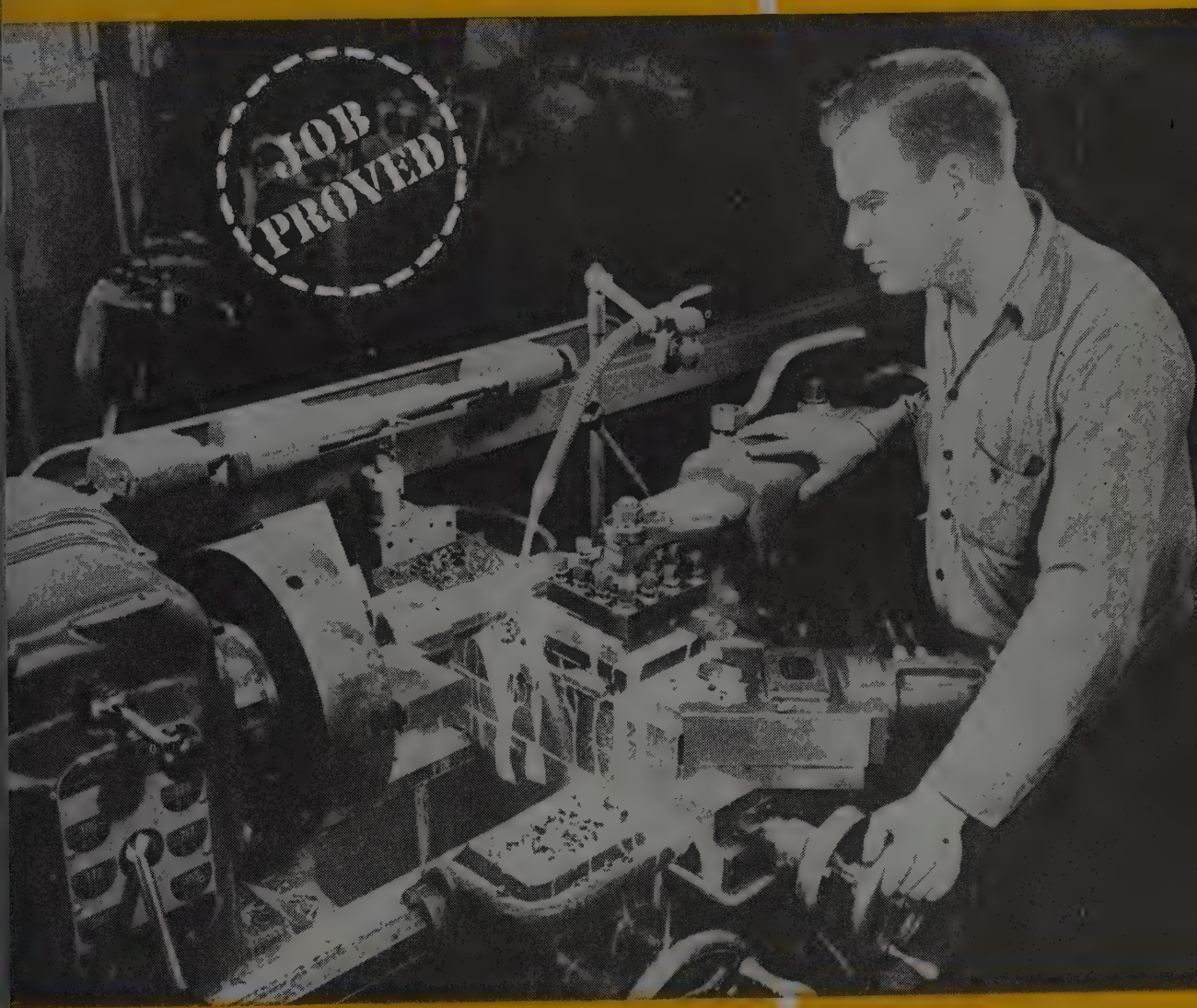
—o—

Ivan V. Wilson has been appointed assistant director of research, Monsanto Chemical Co., St. Louis, in the company's Merrimac Division.

—o—

William A. Krebs has been appointed engineering and sales representative for the Liquid Conditioning Corp., Linden, N. J. He will cover the district including Philadelphia, the counties in Penn-

Turning S.A.E. 4145 Annealed . . . 315 S.F.P.M.



SUNOCO EMULSIFYING CUTTING OIL

Cools and Lubricates Carbide Tool Removing approximately 23 Cubic Inches of Metal per Minute

Here are the facts on a typical job where Sunoco Emulsifying Cutting Oil makes possible heavy cuts on annealed 4145 steel.

- Operation: Turning 4½" shaft and removing approximately 23 cu. in. of metal per minute
- Machine: 16" x 54" "AMERICAN" Pacemaker multi-production lathe
- Material: S.A.E. 4145 annealed steel
- Spindle Speed: 280 R.P.M.
- Depth of Cut: ⅜"
- Cutting Speed: 315 S.F.P.M.
- Feed: .017"
- Type of Tool: Cemented carbide
- Cutting Lubricant: 1 part Sunoco to 20 parts water

Sunoco Emulsifying Cutting Oil forms a stable emulsion when mixed with water. Its lubricating and cooling qualities make it particularly efficient for precision work at high speeds.

For more production . . . better finish . . . longer tool life . . . call your Sun Cutting Oil Engineer or write Department S-6.

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SUNOCO

INDUSTRIAL PRODUCTS

SUN OIL COMPANY • ***Philadelphia 3, Pa.***

Sponsors of the Sunoco News-Voice of the Air—Lowell Thomas

sylvania close to Philadelphia, southern New Jersey, and Delaware. He will have headquarters at Philadelphia.

—o—

E. E. Michaels, Birmingham plant manager for Chicago Bridge & Iron Co., Chicago, has been appointed manager of operations at Chicago. He is succeeded by **A. G. Smith.**

—o—

Inwood Smith has been appointed manager, refrigeration section, Crosley Division, Avco Mfg. Corp., Cincinnati. He succeeds **Lee Stratton,** who has been appointed manager, domestic sales, Crosley Division.

—o—

George W. Hopkins has been appointed Great Lakes district representative for wiring devices, General Electric Co., Schenectady, N. Y.

—o—

J. H. Scott has been appointed sales representative, Gibson Electric Co., Pittsburgh. His territory will cover Watertown and Binghamton, N. Y., as well as all of New York state west of these cities.

—o—

New officers elected for 1947-48 at the recent meeting of the Southern California Chapter, American Foundrymen's Association, are: **Henry E. Russill,** Eld Metal Co. Ltd., was named president; **L. O. Hofstetter,** Brumley-Donaldson Co., vice president; **Earle Shoemaker,** Kay-Brunner Steel Products Inc., treasurer; and **John Wilson,** metallurgical engineer, secretary. Directors for the new term are **Clarence E. Holmer,** Kinney Iron Works; **Arthur B. Lamb,** Independent Foundry Supply Co.; **Myron Niesley,** California Testing Laboratories; **A. L. Goodreau,** G-B Brass & Aluminum Foundry Inc.; and **E. K. Smith,** foundry consultant.

—o—

Stewart C. Brown, Phenix Mfg. Co., Milwaukee, has been elected president of the Milwaukee chapter of the National Association of Cost Accountants. Other officers elected were: **Leslie Aspin,** first vice president; **J. Curran Freeman,** second vice president; **I. H. Stark,** secretary; and **Clarence H. Michna,** treasurer.

—o—

Marion D. Austin has been appointed assistant to **Lester D. Bigelow** in the Chicago office to assist in supervision of the field organization of the Hewitt Rubber Division, Hewitt-Robins Inc., Buffalo.

—o—

Robert M. Ryan, assistant director of accounts and finance, in charge of finance, RCA Victor, subsidiary of Radio Corp. of America, New York, has been named director of the finance department. **Noel D. Stafford,** assistant director of accounts and finance, in charge of accounts, has been appointed director of the accounting department.

—o—

Del Ostroot has been named manager, Foil Sales, South Central Division, Reynolds Metals Co., Richmond, Va. He will maintain headquarters in St. Louis. He had previously served as salesman in the South Central Division.

—o—

Dr. Stephen J. Zand has been elected vice president in charge of engineering, Lord Mfg. Co., Erie, Pa. He has been associated with the company since 1933 as consulting vibration engineer. From 1932 to 1945, Dr. Zand had been employed by the Sperry Gyroscope Co., New York, as senior project engineer, and later as director of the Vose Memorial Laboratory. In 1945 he was made technical aide to the vice president for operations of the parent organization, the Sperry Corp. In his new position he will devote his full time to the Lord Co., and will be responsible for all engineering, research and development activities in the Engineering and Research Divisions.

—o—

Richard K. Lee has been appointed to the position of technical director of the Alloy Rods Co., York, Pa. He had been research assistant and research engineer on slags, steel melting practice and nonmetallic inclusions in steel at the Steel & Tube Division of the Timken Roller Bearing Co., Canton, O. During the last six years, his work has been research engineer on arc welding electrodes, welding metallurgy and electrode production quality control.

—o—

J. R. Warford, formerly managing director of two foreign marketing subsidiaries of Sun Oil Co., Philadelphia, has been appointed special representative in the United States to head a newly created wax section in the company's industrial products department. **George W. Mock,** technical representative for wax products, will be associated with Mr. Warford. Mr. Warford was, until recently, managing director of British Sun Oil Co. Ltd., London, Netherlands Sun Oil Co., Rotterdam, and its subsidiary, Belgian Sun Oil Co., Antwerp.

—o—

Joseph H. Gillies, vice president in charge of radio production, and **Robert F. Herr,** vice president in charge of the Service Division, Philco Corp., Philadelphia, have been elected to the board of directors.

—o—

Harold W. Catt, B. F. Goodrich Co., Akron, has been named manager of the textiles, paper products and advertising purchasing department to succeed **Robert D. Franklin,** who has resigned. Mr. Catt had been manager of the chemicals and pigments purchasing department, and is succeeded by **David L. Flanders.**

—o—

Jay E. Miller has been appointed advertising and sales promotion manager of the Associated Tire & Accessory Lines Division of the B. F. Goodrich Co., Akron. He had been advertising and sales promotion manager of the company's Industrial Products Sales Division.

—o—

A. H. Milnes, recently of Bristol, Eng., has been appointed chief engineer of the Steel Improvement & Forge Co., Cleveland. From 1940 to 1945, he had been assigned to this company as resident technical representative in the United States for the Bristol Aeroplane Co. Ltd., Bristol, and had been associated with the British Raw Materials Mission and British Air Commission. For the past nine years he has served the Bristol Aeroplane Co. Ltd. as production metallurgist be-

RICHARD K. LEE

A. H. MILNES

FAST Off-Center WORK DEMANDS EXTRA STRENGTH, EXTRA ACCURACY

Warco 1200-ton Double Action Tie-Rod Press. Bed Area 60"x120"

RUGGED, powerful, accurate . . . Warco presses are built with *extra factors of rigidity* for fast off-center work.

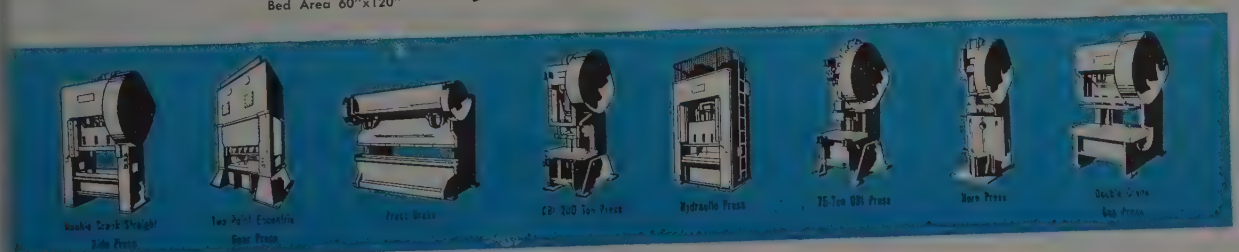
Strong, fully stress-relieved, welded steel construction minimizes frame deformation. Integral box-section columns provide great lateral stiffness . . . prevent shifting of the crown under changing side-thrust loads. The centrally-lubricated gibs are extra long, extra wide . . . give extreme accuracy and long life.

Warco *split-precision craftsmanship* reduces backlash, lost motion, vibration, wear . . . lowers maintenance costs.

For profitable answers to stamping problems, arrange *today* to consult our skilled engineering staff — at no obligation to yourself. Or, better still, visit our modern plant, the largest of its kind in the world.

Warco PRESSES

WARREN CITY MANUFACTURING COMPANY
467 Griswold Street, Warren, Ohio
A subsidiary of The Federal Machine and Welder Company
Offices in Principal Cities



fore the war, and with the development department after the war.

—o—

Robert G. Cady has been appointed manager of the Materials Handling Division of the Ajax Flexible Coupling Co. Inc., Westfield, N. Y.

—o—

William M. Shipley has been appointed eastern regional manager, Crosley Division, Avco Mfg. Corp., Cincinnati. He returns to the division after an absence of six years, during which time he served as vice president of Thomas W. Berger Inc., national sales and merchandising organization.

—o—

Albert A. Sterling Jr. has been appointed district engineer, J. A. Zurn Mfg. Co., Erie, Pa. He will have headquarters in Houston, Tex.

—o—

T. F. Brennan, previously sales division manager in charge of non-food containers in the Atlantic Division of American Can Co., New York, has been appointed to the general sales department. He will supervise nationwide sales, including Canada, of all types of non-food containers.

—o—

E. A. Irwin, general sales manager, E. W. Bliss Co., Detroit, has been elected vice president in charge of sales. **Ray H. Sullivan,** manager of the Brooklyn Division, has been elected vice president in charge of manufacturing. **Walter F. Rockwell,** president, Timken-Detroit Axle Co., Detroit, and **M. M. Burgess,** president, Sheller Mfg. Corp., Portland, Ind., have been elected directors of the company, and **Lloyd C. Irving** has been named assistant treasurer.

—o—

Paul H. Mason has been elected president of Compo Shoe Machinery Corp., Boston. He succeeds the late **William H. Brasnahan. Williar Solar** has been named first vice president in charge of sales.

—o—

Mark J. Millard has been elected a director of Bell Aircraft Corp., Niagara Falls, N. Y., to succeed **Robert J. Woods,** who will continue with the firm as engineering consultant.

—o—

George H. Pratt has been elected vice president in charge of sales, Hudson Motor Car Co., Detroit. He had been general sales manager. He is a director of the company.

—o—

M. R. Schermerhorn Jr. has been elected a vice president of the Glenn L. Martin Co., Baltimore. He has been controller of the company since 1942. **George B. Shaw,** former General Motors Corp., Detroit, executive, has been named director of commercial sales for the company.

—o—

Francis E. Powell Jr. has been appointed chairman of the foreign trade committee of Socony-Vacuum Oil Co. Inc., New York.

—o—

A. F. Wild has been appointed sales manager of television equipment for the Transmitter Division of General Electric Co., Schenectady, N. Y.

—o—

Harold H. Zabel, Allen-Bradley Co., Milwaukee, has been elected chairman of the Milwaukee chapter of the American Society for Metals, and **G. H. Hille,** Ladish Co., Milwaukee, has been elected vice chairman.

—o—

H. C. Wallace, Air Reduction Sales Co., New York, has been appointed manager of the Louisville district office to succeed the late **L. S. Moore.**

—o—

R. J. Selzer has been appointed manager of seven eastern plants operated by the Rheem Mfg. Co., San Francisco. He had been manager of the Sparrows Point, Md., plant.

—o—

Albert C. Beeson has been named industrial relations director of Food Machinery Corp., San Jose, Calif. He succeeds **Glen A. Bowers.**

—o—

W. T. Kellogg Jr., formerly personnel manager of National Motor Bearing Co.'s Redwood City, Calif., plant, has been named replacement division sales representative in the Pacific Northwest, with headquarters at Portland, Oreg. He will be succeeded at Redwood City by **James A. Batchelor.**

—o—

Arthur W. Bull has recently been appointed chief engineer at Michigan Wire Cloth Co., Detroit. He previously had been a project engineer at King-Seeley Corp., Ann Arbor, Mich. Concurrently, Michigan Wire Cloth Co. has announced the establishment of a research and development department, with Mr. Bull in charge.

—o—

Frederick B. Collins and **Edward C. Wells** have been elected vice presidents of the Boeing Airplane Co. and subsidiary, the Boeing Aircraft Co., Seattle. Mr. Collins is vice president-sales manager, and Mr. Wells, vice president-chief engineer.

—o—

H. B. Walters has been named works manager of the Boston Works of the Allis-Chalmers Mfg. Co., Milwaukee. He had been general foreman of the Manchester plant at the company's Pittsburgh Works, as well as assistant works manager there.

—o—

Howard Campbell has been elected president of the Gardner Publications Inc., Cincinnati, publisher of *Modern Machine Shop* and other magazines. **John M. Krings** and **Granville M. Fillmore** have been elected vice presidents; **Margaret L. Gardner,** secretary; and **Richard S. Kline,** treasurer. The board of directors includes these officers, together with **Helen G. Kline** and **Charles H. Deppe,** newly elected to the board.

—o—

Walter Geist, president, Allis-Chalmers Co., Milwaukee, has been elected a director of the North Western Railroad. He succeeds **William T. Faricy,** former vice president and general counsel, who resigned from the North Western in March of this year to become president of the Association of American Railroads.

—o—

Henri Thiebaud, of Bienne, Switzer-

WAYNE RISING

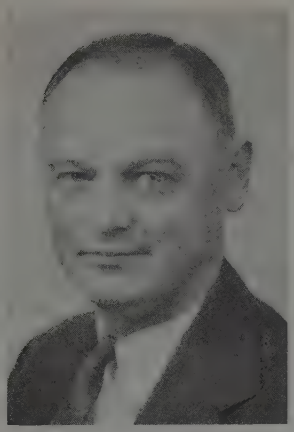
Elected president, Southern California Chapter, American Steel Warehouse Association. Noted in STEEL, May 26 issue, p. 86

LORING PHILLIPS

Appointed market research analyst, Blaw-Knox Co., Pittsburgh. Noted in STEEL, May 26 issue, p. 86

KEMPTON DUNN

lected secretary, American Brake Shoe Co., Jew York. Noted in STEEL, May 26 issue, p. 86



K. U. WIRTZ

Who has been elected president, Electric Furnace Co., Salem, O. Noted in STEEL, May 26 issue, p. 86

W. J. MAIR

Promoted works manager, plant 2, Poughkeepsie, N. Y., International Business Machines Corp. Noted in STEEL, May 26 issue, p. 86

and, has been elected vice president in charge of manufacturing by Gruen Watch Co., Cincinnati. **Aaron Thorne** has been named vice president in charge of the company's Western Division.

—o—

George E. Winters, vice president and assistant to the president, Continental Motors Corp., Muskegon, Mich., has been elected executive vice president. **Lloyd Morrow** has been elected vice president in charge of management-labor relations at Muskegon, and **Frank H. Mull** has been elected vice president in charge of the Shop Control Division. Changes in the Continental Aviation & Engineering Corp., Muskegon, a subsidiary of Continental Motors Corp., include the election of **H. M. Parker,** assistant secretary and assistant treasurer, to fill a vacancy on the board of directors, and promotion of **W. G. Raven** from assistant secretary to secretary, succeeding **B. F. Tobin Jr.,** who recently moved to Los Angeles to take charge of Continental Motors Sales & Service Co., but who also continues as vice president and director of Continental Motors.

—o—

J. L. Geisinger has been promoted to the position of manager of field and experimental engineering of Samuel Moore & Co., Kent, O., and **Harry Ford** to factory manager of the company's plant in Kent.

—o—

The Fort Duquesne Steel Co., Pittsburgh, has appointed **Thomas L. McCombs,** 8 Merchants Road, Rochester, N. Y., district representative in Rochester and surrounding areas. Until recently, Mr. McCombs served as manager of the Rochester warehouse of Follansbee Steel Corp., Pittsburgh.

—o—

W. R. Dabney has been elected director of the Ironrite Ironer Co., Mt. Clemens, Mich., to succeed the late **Robert Potter.** Mr. Dabney is vice president and general sales manager of the firm.

—o—

Edward J. Helline has been appointed general sales manager of the Reliance Division at Massillon, O., of the Eaton Mfg. Co. Mr. Helline has been associated with the company 28 years, during which time he has served in various capacities. For the past three years, Mr. Helline has been in charge of snap ring sales engineering and production.

OBITUARIES . . .

George C. Longman, 77, one of the founders of Acme Steel Co., Chicago, died May 20 in Lakeside, Mich. He served as vice president of the company until World War I, when he resigned to become director of military relief for the Central Division, American Red Cross.

—o—

Charles H. Cooper, 70, for many years, until his retirement a few years ago, construction superintendent for Rust Engineering Co., Birmingham, died May 17 at his residence there.

—o—

Robert E. Downing, 55, president of the Downing Mfg. & Sales Co. Inc., Cleveland, died suddenly May 22. He had been connected with the Packard Motor Car Co., Detroit.

—o—

Robert T. Kent, 66, principal production engineer of the U. S. Army Ordnance Department in 1940-41, died May 23 at his home in Montclair, N. J. Associated with many organizations during his business career, Mr. Kent had recently been production manager, Control Instrument Co., Brooklyn, N. Y., and still later connected with Stevenson, Jordan & Harrison Inc., New York, as consulting engineer.

—o—

Philip A. Farley, 59, zone fleet manager for the Chevrolet Division of General Motors Corp., Detroit, died May 22 in New York, where he had maintained headquarters.

—o—

Louis Radke, 63, sales manager of the Horicon, Wis., plant of the Van Brunt Mfg. Co., died recently.

—o—

Thomas S. Hemenway, 65, founder and president of the Metal & Alloy Specialties Co. Inc., Buffalo, and president of the Non-Ferrous Founders' Society, died May 25.

—o—

Leonard F. Cowell, 59, retired sales manager of Lamson & Sessions Co., Cleveland, died May 26. He had been associated for 20 years with the company, and retired 10 years ago.

—o—

Arthur L. O'Connell, 59, sales representative for the Linde Air Products Co., died recently in Milwaukee.

—o—

Charles D. Brown, 60, electrical engineer for the Electric Co., Milwaukee, died recently. He had been with the Electric Co. since 1916.

—o—

Fred W. Niels, 72, office plant manager of the Tri-City Steel & Supply Co., Moline, Iowa, died recently of heart attack at his home in Davenport, Iowa.

—o—

Samuel L. Schefrin, 51, president of the R. E. Locher & Schefrin Co., Milwaukee, died suddenly May 18.

—o—

Wolfgang Reisinger, 80, president of Robert L. Reisinger & Co., Milwaukee, died recently.

What th

This is the only factory-type building in existence large enough to house the National Machine Tool Show of 1947—the "World's Greatest Machine Shop". Photo by Hedrich-Blessing Studio

HERE IS a report of vital importance to you as an executive in the metalworking industry. It makes no difference whether your business is large or small, local, national or international in scope. It makes no difference whether it dates back to the days of Eli Whitney or only to World War II. It makes no difference whether your primary interests are in financial, managerial, engineering, production, personnel, purchasing or marketing operations. This report is of vital importance to you because it is about machine tools.

This year of 1947 is one of those years during which machine tool design is coming in for a general going-over. The same thing is true of machinery for pressing and forging. It is true also of tooling and production methods. Such periods of change have come about at irregular intervals throughout the 150 year history of the machine tool industry here in America.

They have had economic effects—both here and abroad—out of all proportion to the relatively small size of the machine tool industry. Machinery users who have tied in their equipment programs and their manufacturing operations with these cycles of development, have risen to new heights of prosperity. Others who ignored these cycles have been forced out of the competitive race within a short time.

Since the spring of 1915, I have been intimately involved in these cycles—for the first 15 years as a member of the machine tool industry and for the last 17 years as a professional observer of these cycles and interpreter of them to just such people as you. On the basis of this experience rests my conviction that I have at this time a vital report for you on this current cycle.

At no time since the early 1920s—when we were going through a comparable period of postwar industrial readjustment—have I been aware of more and more sweeping redesigns and completely new designs, than there are right now on the drafting boards and in the experimental rooms and on the testing floors of our American machine tool builders.

American machine tool builders today are unrivaled in experience and facilities for development, manufacture and tooling of improved models. Warner & Swasey photo

By GUY HUBBARD
Machine Tool Editor, STEEL

Machine Tool Show Means To Metalworking Executives

A brief report on signs and portents of the current wave of design activity in the realm of machine shop practice

At no time in the history of the metalworking industry have there been as powerful and as numerous forces for change pressing upon and inspiring the machine tool builders of this country. Here are just a few of those forces. There is, first and foremost, the labor situation in the machine tool using industries. Everyone wants more and more for putting forth less and less physical and mental effort. At the same time, everyone wants to have more things to enjoy and more free time in which to enjoy them.

Consummation of this 1947 version of the American way of life (more and better and cheaper things, and more and better jobs making those things) is in the final analysis, up to the machine tool builders and to the closely related tool engineering profession. In the words of one of the well-known machine tool builders: "A man's productivity no longer is measured by the hours and minutes he works—but rather by the capacity and efficiency of the machine he operates."

As a result of this state of affairs there has arisen an insistent demand for more effective utilization of carbide tooling. There is growing interest in modern electrical drive and control techniques—including practical applications of electronic tubes. There are remarkable advances in hydraulic actuation—including servomechanisms which combine delicate "touch" with almost irresistible power in connection with form controlled machining.

Then there is the competitive effect of new methods of forging, press forming and casting methods which in many cases do away with roughing cuts but which demand extra speed and precision in finishing cuts. There is the ever mounting demand for automaticity— including methods for exact reproduction of work from cam layouts or from templates, by means of program control methods and even from drawn or scribed lines.

Still other techniques which are strongly affecting the machine tool design situation are: High-cycle direct motor drives for high speed spindles, electromagnetic vibration for feeding work and chips, pneumatic bellows and air cylinder actuation and control of accessories and tools, hydraulic systems of auxiliary actuation, built-in diamond and crush dressing devices for forming abrasive wheels, built-in air and electro-gaging and size control systems, microscopes and periscopes adapted to exact machine setting, electro and permanent magnet workholding and automatic spacing devices for "jigless" drilling.

This list could go on and on. While some of the things

Cleveland Show in 1935 *in full swing. Chicago Show will be twice as big. Many* 1935 *machine tools are "museum pieces" compared with those which will be unveiled at Chicago. Photo courtesy National Machine Tool Builders' Association*

12 acres of exhibits under power, all on a single level, wood block floor. A show for metalworking executives. General public not admitted.

250 exhibits involving machine tools of 220 types, including several variations of some types and many combinations of various types, forging machinery and presses, tools, accessories and attachments.

Experienced operators who will demonstrate and interpret machines and tooling in terms of your own business and in terms of your own activities in that business. Technical program of Machine Tool Congress ties in with practical demonstrations of machines.

Chicago Convention Bureau promises rooms for visiting executives. Chicago Committee of Builders and Dealers will facilitate transportation of domestic and foreign visitors. Special buses from Loop hotels to the Show.

just mentioned may sound like technical mumbo-jumbo to financial and managerical executives, I can assure you that they have direct influence both on the corporate pocketbook and on labor and customer relations. None of these things can be ignored when important decisions are being made at this critical time, decisions such as whether to carry on operations with old machines, purchase out of government surplus, or buy new machines from the builders.

How then can these things be evaluated, especially by those who are not engineering, tooling or production men but who do nevertheless have the final "say-so"?

The answer lies in the big Machine Tool show which will be staged by the National Machine Tool Builders' Association at the former Dodge aviation engine plant in Chicago, September 17 through 26, 1947.

There have been many other machine tool shows, but never one to equal this one in size, in scope or in "critical timing." Moreover, there has not been a National Machine Tool Show since the now historic one held in Cleveland in October of 1935.

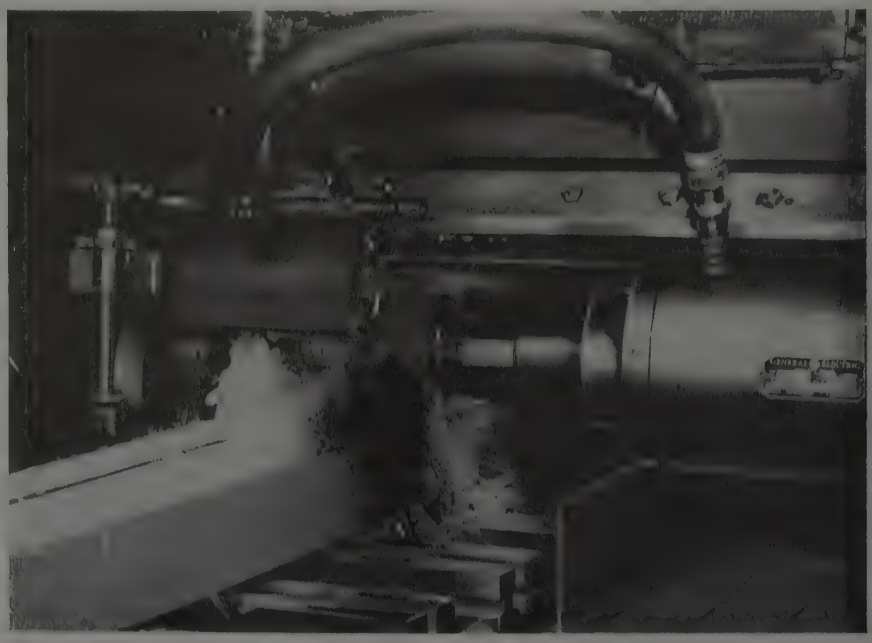
Twelve years are a lot of years in the life of the machine tool industry. Even though this is not an industry given to "yearly model changes," things have happened during these 12 years which make many of the best of the 1935 models the economic equivalents of Dodo birds when compared to some of the 1947 models which will be unveiled at Chicago.

In making that statement to you executives of the metalworking industry, I am doing so as one who has been traveling up and down and crosswise through machine tool America, getting previews of what is going on in a large number of the plants of the 250 or more companies who will exhibit at this big show. What I have seen I must hold in confidence until the show opens. At the present time I can be no more specific as to details than I am in this report.

However, I cannot be too vehement in my recommendation that you metalworking industry executives of every type and of every level should go to that National Machine Tool Show in Chicago. There ought to be at least 100,000 of you there.

Experts in charge of the more than 1000 modern machines of more than 220 types which will be on display under power, will be capable of demonstrating and interpreting this equipment to you in terms of the particular business you are in and in terms of the particular phases of that business with which you are directly concerned.

Insure the future of *your* business by tying in properly with the current cycle of development in machine shop practice. Attend the National Machine Tool Show in Chicago in September and you will learn exactly *how* to do this.



This special milling machine with high speed motorized spindle is typical of wartime developments having revolutionary influence on postwar machine tool design. Many standard machines at 1947 *show will demonstrate similar ability to cut metal at speeds formerly associated with woodworking. Photo courtesy Onsrud Machine Works Inc.*

atest developments on method that converts rough chemical reaction the surface of inc or cadmium from pure metal to a complex chromate

Chemically Generated Film AIDS IN CORROSION CONTROL

Fig. 1 — Corrosion of body panels due to galvanic action between dissimilar metals

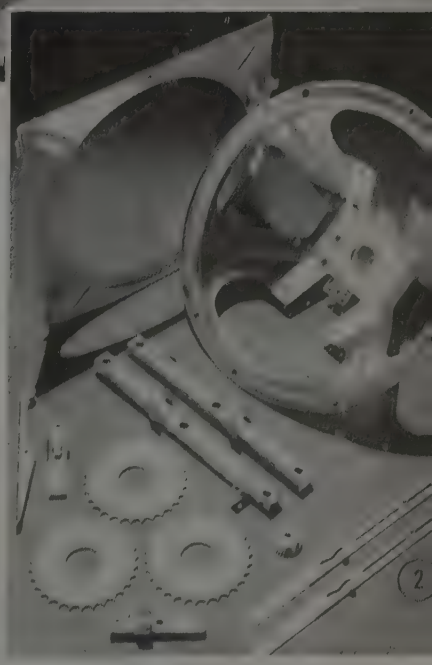


Fig. 2 — Examples showing bright finish imparted to zinc parts. Illustration shows radio, phonograph, sprocket and typewriter parts

DURING World War II, a nonporous gel-like ilm contributed much to the war effort by increasing orrosion resistance of zinc and cadmium. It was speci- ed by the Army and Navy for various equipment— ither as a final finish or as a paint base. Hand grenades, ll types of fuzes, airplane propellers and landing gears, adio and radar parts were among the many items treated ith the product.

Although development work for new postwar appli- ations of the coating is progressing in the company's aboratories, and new formulations are being uncovered meet requirements of expanding uses, much is yet to e learned about the characteristics of the film.

Approximately 0.00002-in. thick, the film, called Irid- e, according to its maker, Allied Research Products Inc., altimore, is chemically generated on any zinc and cad- imum surface by simply immersing the part in the Irid- e solution for several seconds. The chemical reaction nverts the metallic surface from a pure metal state a complex chromate.

It is established that the film takes considerable nounts of cold working. For instance, some zinc-plated ire (acid zinc) was coated and then put through cold awing dies, effecting diameter reductions of 20 per nt without removing the film. It also is established, nder such conditions, that the corrosion resistance of the iginal film is somewhat reduced. Containers are suc- ssfully fabricated from sheets treated with the coating en though manufacture involves stamping, shearing, uble-lock seaming and bending operations. In an- her instance, a complete truck cab top was drawn from sheet similarly treated.

In cold working zinc with an Iridited surface, it ap- ars the coating takes whatever strains the zinc will stand except where the action is of a cutting nature. Allied Research finds, however, that if the film is cut through, or fractured because of fracturing the underlying zinc, the protection afforded is reduced; but nevertheless affords considerably more protection than an untreated surface.

Another characteristic discovered in the film is its behavior when exposed to heat. If the film is exposed to 250 to 300° F temperature for 10 to 15 min, it darkens slightly and becomes quite hard, but not brittle. Ordinarily, cutting actions such as those obtained with steel wool, remove the film; but after giving the surface the heat treatment mentioned above, the film hardens suf-

ficiently to resist the cutting action. Corrosion resistance to salt spray is reduced, but resistance to acids and alkalies is measureably increased. In fact, it is quite difficult to strip off the coating in hot commercial alkali cleaners.

The phenomenon, on the other hand, does not take place apparently when the film is used as a paint base for baking paints. The film adds to the corrosion resistance of the paint film by suppressing the formation of zinc compounds between the zinc metal and the underside of the paint film. A recent test, for example, disclosed that a film of paint afforded only 60 hours of salt spray testing; whereas when Iridited, it afforded 550 hours of salt-spray resistance.

Surface Condition	S. S. Hr. to Red Rust
Zinc plate only	36
Zinc plate plus paint	96
Zinc plate plus Iridite	350
Zinc plate plus Iridite plus paint	900

For most of the Iridite products produced by the company, it is necessary to use an acid flux to solder surfaces treated with them, the latest development— Bright —can be soldered with resin fluxes. The radio industry finds this highly acceptable since acid fluxes cause corrosive conditions that interfere with the proper performance of the equipment. It is reported that Iridite Bright actually assists in the soldering of both cadmium and zinc. Whether this is due to the treated surface bein free of oxides or actually acting as a flux is not yet known

Corrosion conditions such as those illustrated in Fig 1, 3 and 4 are well known to the average car owne These views show respectively three types of corrosion namely, water, galvanic and atmospheric corrosion. Irid ite now is being used to combat these type conditions— either as a final finish or as a paint base.

Iridite Bright, the latest development, lends zinc plat an appearance similar to that of chromium plate, an keeps it that way. It is being used extensively for pc handles, radio components, wire products, motorcycl parts, refrigerator and washing machine units, and whole host of products requiring an inexpensive an lasting bright finish.

In addition, Iridite films can be dyed black, blue, red and green, aside from the basic colors of bright, oliv drab and bronze. One leading motor car manufacturer, fc example, uses olive drab on all hardware to prevent th oxidation or "freezing" caused by formation of whit salts on zinc. Appearance is not a factor in this case sinc the parts are either covered up with paint or located i hidden places. Typewriter, electrical and tool manufac turers, however, use some of the above mentioned colo with and without a clear lacquer coating. The colors als are used for identification purposes to speed and simpli fy production assemblies.

As a paint base on zinc die casting, the gel-like filr proved itself forcibly, and is being used on such items as juicers, coffee grinders, electrical junction boxe and gas regulators, to mention a few. It also is used a a paint base on zinc plate on such applications as ligh fixtures, hardware, washing machine and camera parts i addition to wall panels.

A prominent storm window manufacturer fabricate component sections of the entire sash from steel mill elec troplated sheet. After spot welded fabrication, the section are Iridited and given a coat of paint before shipment t the consumer. Such sash the company guarantees agains rust. A leading insect wire screen cloth maker zinc plate the woven wire screen cloth by continuous methods, in cluding Iridite and clear lacquer in the same productio line. Resultant product has the appearance of bronze bu due to the lack of oxidation—encountered with bronz wire in household usage, there is no staining of whit woodwork.

One large soft-drink vend- (*Please turn to Page* 144

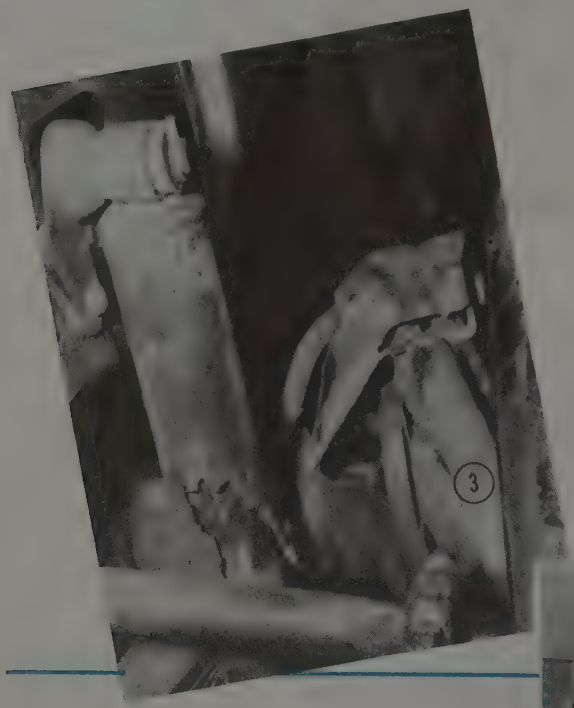


Fig. 3—Shock strut here is good example of the effect of corrosion due to oxidation

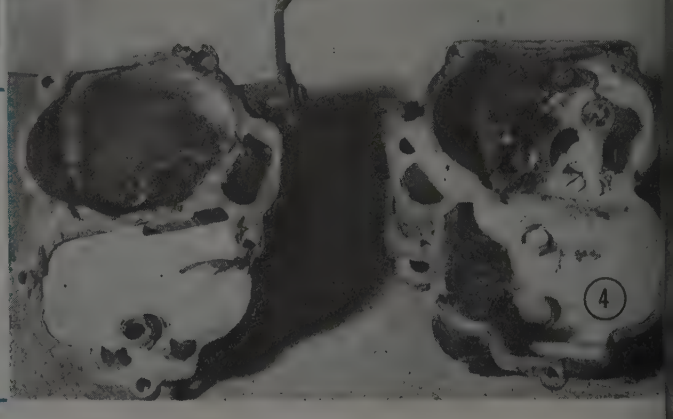


Fig. 4—Corrosion due to condensation of water from gasoline passing through carburetor

MEMORIAM: In the month of May, within 10 days ach other, two men who played important roles in development of the machine tool industry as it exists y, died. Each of these men was one of the founders large company which is widely and favorably known. n retained his association with his respective company more than 50 years.

was well acquainted with both of these men for a period of years—with one of them as the president company with which I formerly was connected; with other as one of the "elder statesmen" of the machine industry.

here are points worthy of consideration in the charac- and careers of these two men. I want to review a of those points in the following paragraphs.

BERT W. HENN, 1865-1947: At the time of his th on May 14, A. W. Henn had rounded out 51 years a director of the National Acme Co. of Cleveland, ough he had retired as president of the company in 5. With his older brother Edwin C. Henn, who was experienced shop man, and Reinhold Hakewessell, a gner, A. W. participated in the founding of the com- y in Hartford, Conn., in 1896, on a basis which today ıld be impossible because of the manifold restrictions ounding the launching of new enterprises.

The original shop was a rented room in a loft building h plaster falling from the ceiling. Simple though their ginal multiple spindle automatic was, there are few hanics in this day and age who could build such a chine under such conditions. Some parts of it were achined from details rescued from Pratt & Whitney rgue"—with the knowledge and consent of Messrs. tt & Whitney, for whom E. C. had worked as a tool- ker during the day to earn money to carry on his ma- ne tool experiments at night. A. W. in the meantime l spent three years as a bookkeeper in Cleveland and l put every dollar he could spare into the venture.

Despite all predictions to the contrary, the multiple ndle automatic did work. The only way that prospects ıld be convinced of that fact, however, was to get m to send brass rods for conversion into parts. The ished parts were returned to the prospects. Chips and ends became property of the men in Hartford. They l them and that was their reward for a job well done. A. W. went into the thing on a full-time basis in 1897— l when I say "full-time", I don't mean eight hours a y. He worked all day as a salesman and handled the respondence and kept the books at night. The big eak came in 1898 when A. W. managed to sell W. D. B. xander of Cleveland on the idea of setting up a plant Cleveland for manufacture of cap and set screws on new "multiples." This involved 20 machines.

In 1901 the machine tool end of the business was oved from Hartford to Cleveland and was merged with e screw business in Cleveland. That was the beginning National Acme as we all know it today. In view of hat it has developed into, I cannot help but feel that it as providential that A. W. and E. C. Henn and Rein- ld Hakewessell—back in 1896—did not have to submit the ministrations of the SEC and Wages and Hours ecialists and others of that ilk. If they had, their project ould have "died aborning," and a lot of good jobs would ot have been made for a lot of people.

Seen and Heard in the Machinery Field

By GUY HUBBARD
Machine Tool Editor

AUGUST H. TUECHTER, 1869-1947: When Mr. Tuechter died on May 17, it was 60 years after he had become office manager of the old Bickford Drill Co. in Cincinnati, where he began his career as Henry Bickford's office boy.

August Tuechter grew up with that company—and its successors developed around a pattern very largely set by him. He was successively general manager and partner, Bickford Drill & Tool Co.; business manager and half owner, Cincinnati Machine Tool Co.; and president, Cincinnati Bickford Tool Co., which is the organization with which so many of us today are familiar.

This is a fine example of one of those institutions which is "the lengthened shadow of a man." Mr. Tuechter was that man, even up to May 5 when he made his final visit to the office in a wheeled chair. Within the last few months his body had failed, but that certainly was not true of his spirit. That spirit will prevail as long as the company endures, and that, I predict, will be for many, many years.

August Tuechter had heavy responsibilities to carry for many more years than most people do, and he took them more seriously than most people do. They began when his father died when August was a young lad. There were plenty in connection with the building up of his machine tool business, in the development of the fine reputation of the products of that business, and in the building up of the national and international markets.

He believed in the dollars and cents value of neatness and order. His shop is a model of good housekeeping. He believed that good machine tools can best be built by the use of good machine tools—including those of one's own manufacture. He took pride in taking visitors through the shop—and that included visitors' wives. As he put it: "Our shop always is fit for a lady to see!"

August Tuechter sometimes was pictured as a "rugged individualist." That was not entirely fair to him. What he really believed in was "team work," even though he did believe that every team should have a competent driver to make sure that it pulls together.

For example, he was one of the early advocates of a strong National Machine Tool Builders' Association. He devoted a lot of time toward getting the industry to pull together, and in the right direction—instead of pulling at cross purposes. From feeble beginnings back in 1902, he helped this Association more than most people realize to develop into the solid, influential organization that it is today. A lot of us are going to miss those letters which always began with "Dear friend." He meant exactly that.

DRAWING AND FORMING STEEL WITH Zi

By S. MENTON

Manufacturing Manager
General Motors Overseas Operations
Detroit

ORGANIZATION of suitable facilities for production of cast Kirksite dies, jigs, fixtures and the like, considered separately from any existing plant, involves the following functions and departments:

1. Design
   (a) Dies
   (b) Patterns
2. Patternmaking
3. Foundry
   (a) Molding
   (b) Casting
4. Tool Room
   (a) Finishing
   (b) Tryout
5. Storage
   (a) Patterns
   (b) Dies
6. Supplies

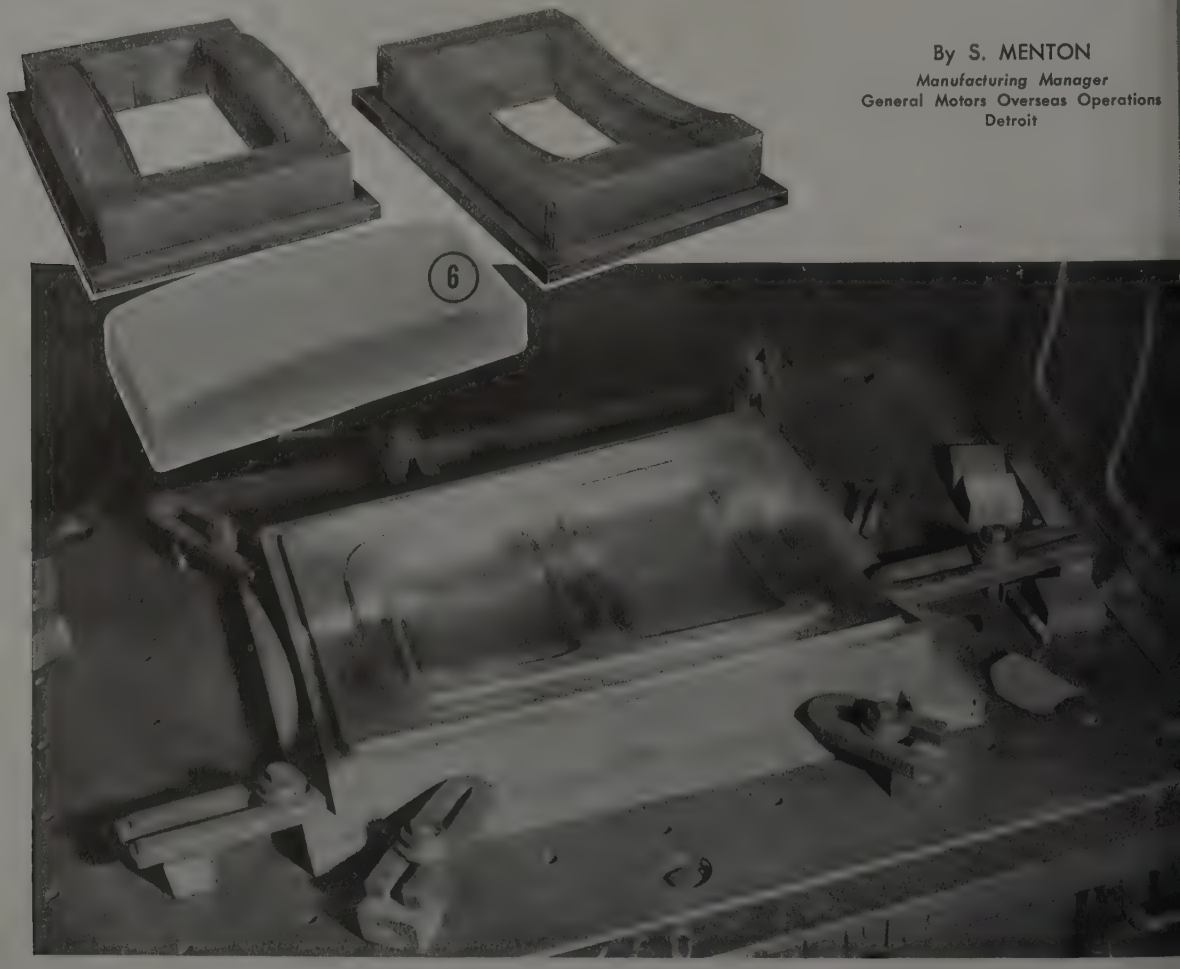
These various functions will be discussed in detail in this and succeeding installations of the series of articles.

Constant development of new products, among which those of flat-rolled steel play a prominent part, makes the work of the diemaker more important and interesting. As every new item or modification of an existing one presents a change in shape or size, the work of the designer presents little repetition of detail. This, added to the individual character of the work itself, makes it necessary that the designer rely almost entirely on his accumulated knowledge, experience and study of the subject. With due regard to other phases of the work, the designer's part is a most important one in toolmaking. His skill and experience determine the end result in all its aspects.

By definition, a die is a tool so shaped as to impart a certain desired form to an object by cutting, bending, p ing or squeezing. Each of these operations may be d in an infinite variety of ways, from simple shearing, p forating and bending, to the more intricate method stretching and drawing the metal.

For cutting or blanking, the die components are re tively simple, consisting of a nonmoving member on wh the material is to be placed and a movable memb through which force is applied. This may be in the fo of a block through which a knife or cutter of some p ticular form operates. On large objects the punched-c piece becomes a blank and the surrounding area becom waste or scrap.

In bending or simple forming operations, the same e



Alloy Dies

In this second part of the series the author discusses such points as: Factors in die designing, importance of alloy plasticity, use of inserts, binder rings, etc.

ments described above are used, except that space equal to the thickness of metal must be provided between the punch and die. Generally, a third and movable element is introduced to eject the formed object from the die cavity. A fourth element is sometimes necessary to strip the formed piece from the punch or male forming member.

In embossing and coining, the metal is squeezed between opposing die members. One or both members are incised, or cut, in relief; or one member is sunk to the required shape and the opposite is made to fit into the corresponding cavity to obtain the desired result.

Dies for stretching, or drawing sheet metal also generally consist of a sunken member and an opposing male punch form; but require additionally, a pair of matched pressure rings or jaws to hold the blank while it is being stretched or drawn over the punch. Unless details such as reverse curves and embossings are required in the stamping, the cavity in the lower draw ring is used as the female die member. Reverse curves and embossings require a fourth die member which is opposite to the contour of the punch.

Term "forming die" applies to a class of tools which shape sheet metal by bending or forming it to shape without excessively stressing it. Generally, their design does not present any formidable problems, but occasionally even one of these will require all the skill that an experienced designer has at his command. What may appear to be a simple problem may not respond to a simple solution. A study of the problem may reveal that the potential displacement and distortion of the metal requires a tool that is more complicated than what at first seemed necessary.

Design of dies for drawing operations, which cause metal to "flow" under tension, (*Please turn to Page* 128)

Fig. 6—Another set of patterns for a 3-component draw die, showing plaster punch pattern, all-wood draw ring pattern at left background and plaster face on opposite ring pattern for which all-wood pattern served as master. Ring contours are designed to control flow of metal and differ from shape of punch

Fig. 7—Close up of typical zinc alloy forming die mounted in press, with finished part at extreme right

Fig. 8—Draw die mounted in press, showing two guide pins and equalizer blocks at four corners of die. Blocks are of steel, milled to provide spacing of 0.003-in. over the thickness of stock

A Fresh Approach to Machining Diese

By E. K. MORGAN
Vice President
Giddings & Lewis Machine Tool Co.
Fond du Lac, Wis.

In boring, milling, drilling, and similar operations, rehandling heavy, high precision parts for engines is a serious problem in diesel manufacturing plants. Examination of progressive methods employed by one leading West Coast builder reveals adaptability of horizontal machines for variety of operations

DIESEL engine builders today are under steady and growing pressure to produce engines faster in order to meet urgent and increasing power needs. In meeting competition, they are further challenged to incorporate the latest refinements and improvements in the engines leaving their respective plants. To meet these demands, diesel builders must rely heavily upon the capability and reliability of the machine tools used in their manufacturing departments.

Because of size, shape and weight, many diesel engine components present difficulties in machining, especially if single purpose machine tools are used. To complete such operations as boring, milling, drilling, tapping, reaming and similar machining, heavy diesel parts must usually be moved from one machine to another. Many manufacturers are finding that general purpose standard horizontal boring, drilling and milling machines simplify their machining methods and do away with this rehandling. A typical installation of such equipment is shown in Fig. 5. In some of the larger diesel plants, especially on the West Coast, methods of work procedure actually are planned around these particular machines, the reason being that such machines are open in construction, permitting work extension in any plane regardless of length, width or height. In other words, there are no interfering columns, brackets, supports, or overhead structures to hinder work setup. Time for setting the work also is reduced to a minimum which of course is a definite advantage.

Still, it should be remembered that placing a frame, bed, block, manifold,

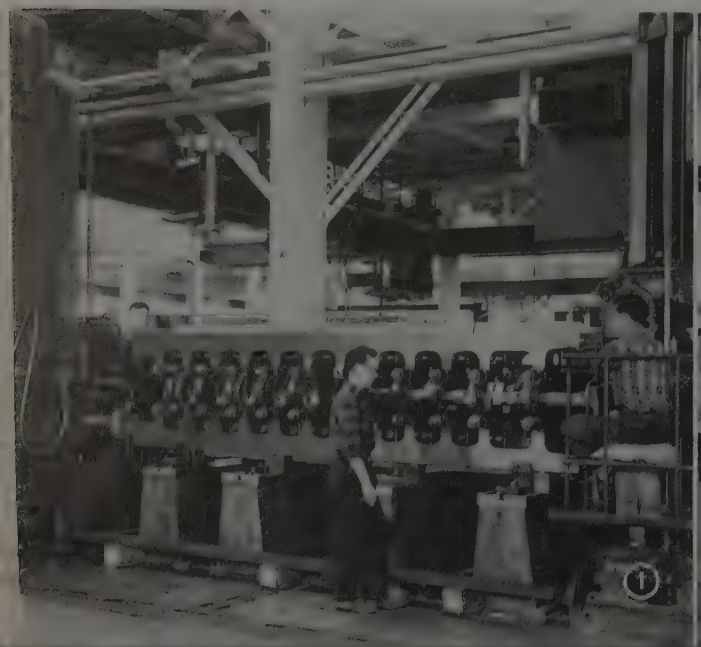
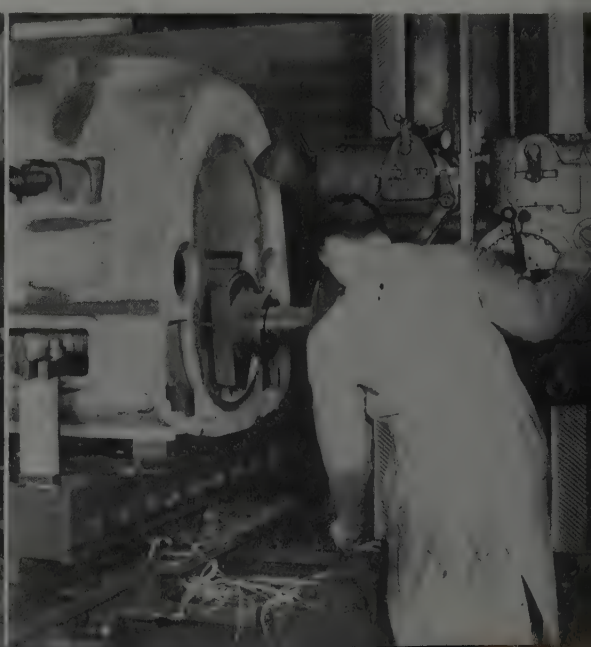


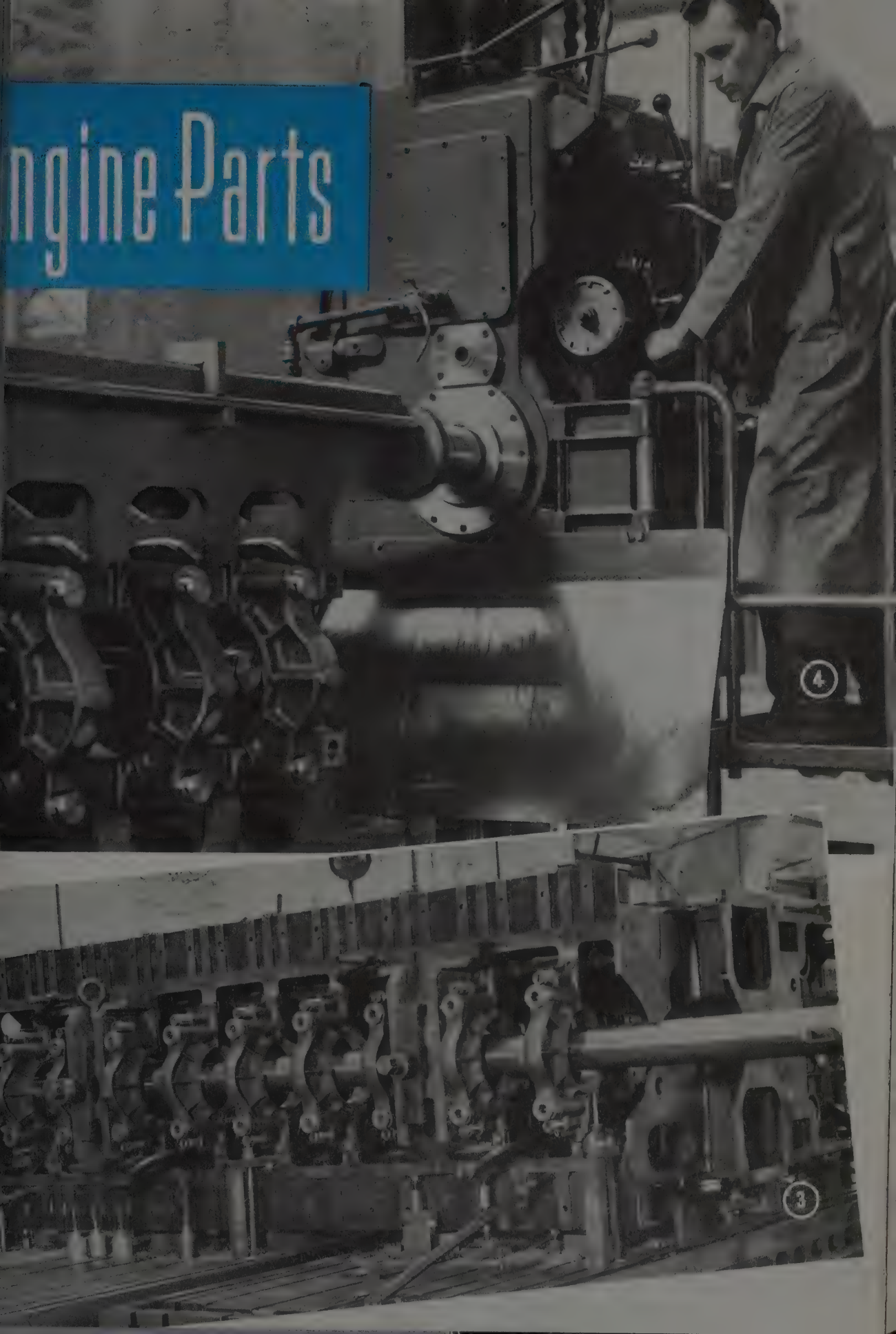
Fig. 1—Two floor type machines performing different machining operations simultaneously. Right hand machine completes a thrust bearing facing operation while left hand machine mills end of engine block

Fig. 2—After lower bore in this impeller casing is completed, machine headstock is raised and upper bore likewise is completed, all without disturbing setting of work in the table-type horizontal boring, drilling and milling machine

Fig. 3—Boring main bearing seats in eight-cylinder opposed piston type diesel block is accomplished efficiently by this setup. To insure alignment of bore and to prevent bar sag, two auxiliary supports are used

Fig. 4—Milling end of diesel engine block on floor type horizontal boring machine. Traverse movement of column on runway feeds the tool

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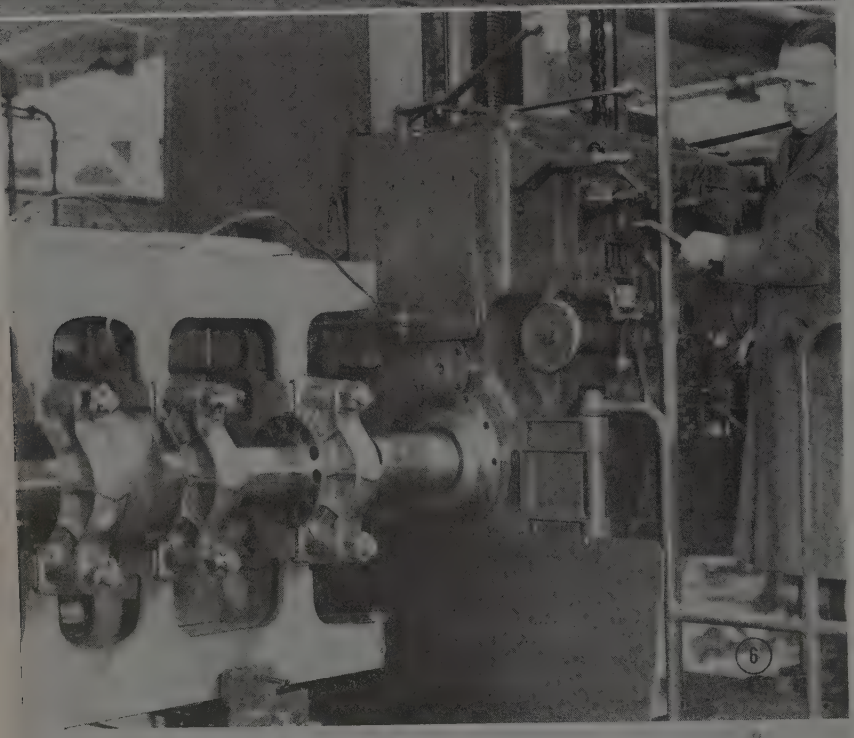
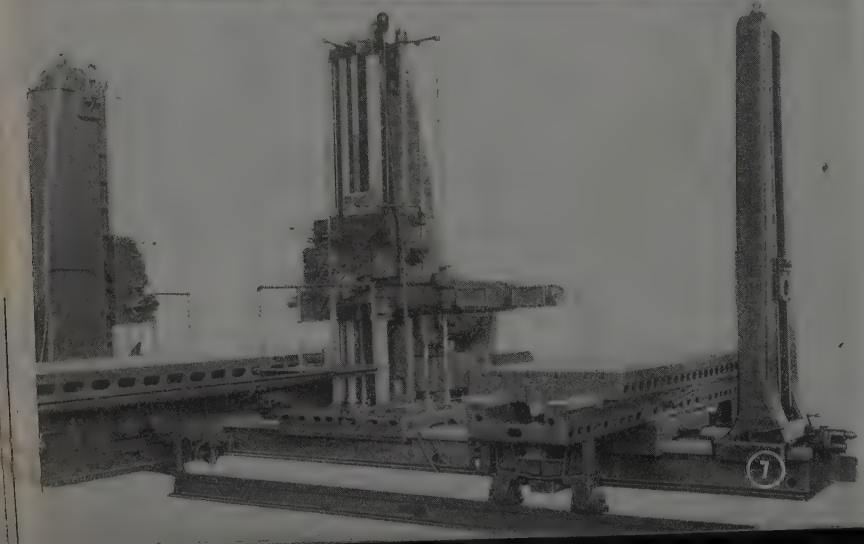




base, yoke, crank or even a complete engine on the machine is only one step in the manufacturing process. Actual machining operations or combinations of operations play the major part in production economy.

Bear in mind that diesels are high precision engines, hence dimensions of their parts must be held to specific and close limits. When it is possible to mill, bore, drill, ream, tap and face in a single setup on the same machine, precision operations can be completed faster and more accurately than if the engine components had to be moved in the plant for each individual operation.

Examination of machining methods employed by the leading builder of diesels gives conclusive evidence of the important role of horizontal boring, drilling and milling machines in producing engines components. Simultaneous operation of two floor-type horizontal boring machines will be of special interest to tool engineers. This is pictured in Fig. 1.

These machines have a common base plate, and the workpiece is mounted between the two units. In this way, one machine can perform a series of boring operations on one side of the casting or weldment while the second machine mills, drills, reams or taps the end of the work. Such tandem setups are especially useful in eliminating re-handling in the production of opposed piston type engines. After the crankshaft bearing saddle has been bored, the cheek of one thrust bearing must be faced. To accomplish this, a short line bar is inserted through a support bushing placed in the bearing bore. A special facing

(*Please turn to Page* 142)

Fig. 5—Four floor-type Giddings & Lewis machines arranged to perform variety of machining operations on large diesel blocks. Movement of machine columns on individual runways simplifies positioning of cutting and boring tools

Fig. 6—An interesting point about this facing operation is the simple manner in which the boring bar is supported. Precision bushings placed in bearings Nos. 1 and 4 support the bar during the cut

Fig. 7—Equipped with an additional headstock and column assembly, this planer-type horizontal boring machine has exceptionally wide work range. Right hand column is removable, permitting auxiliary table and saddle to move forward to the "planer" table, where both are synchronized. Repositioning columnn assembly on runway enables this machine to perform work in much the same manner as two floor-type machines

T FOR LONG HAUL: In Akron, ear Tire & Rubber Co. is now ucting a rubber conveyor belt which ventually raise 600 tons of coal per o a height of 715 ft, a height which y 7 ft the 52-story Terminal Tower eveland. About ½-mile long, the will be used by Tennessee Coal, & Railroad Co. in its new Concord near Birmingham, to deliver coal the bottom of the slope to a tipple e mine's mouth. More than 330 cables, each endless inside the elt's circumference, will be used in 2-in. wide giant. When completed, uge belt will weigh 42 tons. It be delivered to the mine in five ns and spliced into one continuous n.

HODIC CONVERSION: In Eng- changeover from full war produc- of government ordnance plants to time products was made methodi- to minimize any change of plant orks organization. As a result all s are immediately adaptable to 100 ent war work. At present 22 fac- are in production employing some 0 workers, turning out both ord- work and peacetime products such l drilling equipment, woodworking hosiery making machines, trucks, es, clock parts and clothing. The rnment plants co-operate with pri- industry, and compete on equal , either in the form of tenders or harging for their products at cur- market prices. The Ministry of ly, which controls these activities, dded "insurance" also instituted a r apprentice scheme. After com- g the courses, young men become qualified engineers and craftsmen an then take jobs either in the gov- ent plants or if they prefer, private try.

N HEALER: First, second, third e and x-ray burns can be healed ly, and in most cases without any by a recently developed sulphur ound called Hydrosulphosol. The ct, according to Rees-Davis Drugs Meriden, Conn., relieves pain al- instantly by forming an air-tight over the burn area. It is termed e nontoxic remedy for burns of all , including those caused by lye, e, open flame or acids.

NES ON ANY PLAN: Companies g with Downs Crane & Hoist Co., Angeles, have a choice of three ds of installing cranes in their re- spective plants. Under the West Coast concern's new service plan a company can either purchase outright any type crane ranging from a small jib to a double-girder overhead traveling unit; it can obtain completely assembled unit parts of any of these cranes for attachment to "home-made" unit; or it can purchase engineering, design and shop drawings for completely fabricating its own crane.

RESUMES TUBING PRODUCTION: Reynolds Metals Co., Louisville, reports it has again resumed production of flexible aluminum tubing for use on appliances and accessories, a line discontinued during the war. Supplied both in straight lengths and in coils, the tubing is made ¼ and 5/16-in. OD; 0.035-in. for ⅜ and with a wall thickness of 0.032-in. for 7/16-in. OD; 0.042-in. for the ½, 9/16 and ⅝-in. OD; and 0.049-in. for the ¾ and ⅞-in. OD.

MAKES RESEARCH CONTRACT: Signed contract for a new research project to be conducted by Battelle Memorial Institute for the American Gas Association was recently delivered to the institute's director, Dr. Clyde Williams, by Eugene D. Milener, co-ordinator of general research for AGA. The project provides for an engineering and field study of the relationship of high-frequency induction heating and industrial gas heating, in the heat treatment and forging fields.

ONE WORD FOR IT: In Maywood, Ill., it is learned, Chicago Metal Hose Corp. sums up the art of manufacturing flexible metal hose in one word—"Flexonics." The word is defined by the company "as the science of controlled bending of thin metals for use under varying conditions of temperature, pressure, vibration and corrosion." It combines many skills, all stemming fundamentally from three major segments of the manufacturing plan—research, development and installation know-how, the concern states.

FIGHT UNDERGROUND ACTION: To date 11 nation-wide organizations—eight industry associations, two national communications systems and a professional association—have taken formal action to fight underground activities of those metals enemies—soil corrosion and electrolysis. Since August 1946, work has been in progress to organize the Correlating Committee on Cathodic Protection, an inter-industry activity to publicize and to improve procedures for handling problems arising from cathodic protection of pipe lines, communication cables, railroad signal systems and other buried metal structures. Importance of this committee's work canont be overlooked when, according to the Bureau of Standards, about $200 million are spent annually for pipeline replacements alone. According to H. H. Anderson, vice president, Shell Pipe Line Corp., and chairman of the committee, a current flow of 1 amp caused by either electrolysis or soil corrosion will destroy in a year 20 lb of steel or iron or 75 lb of lead.

SIMPLIFIES CRANE OPERATION: Close to 5000 moving parts found in ordinary crane excavators are missing in the new hydro-crane developed by Milwaukee Hydraulics Corp., Milwaukee. It has no drums, gears, clutches or brakes —so simple is its operation that a boy could learn to run the machinery in 10 minutes, it is reported. All phases of the crane's operation are controlled by only a half dozen levers. Currently made in 2, 3 and 5-ton models and mounted on 1 and ½-ton trucks, the crane uses 11 hydraulic rams in its operations. These are pressure fed by a power takeoff from the truck engine.

CHANGES SPEEDS IN 1 SEC: Featuring only half as many parts as present automatic types, a new transmission that can shift into any one of four forward speeds in 1 sec, and which is readily adaptable to push-button control was announced recently by Wright Aeronautical Corp., New York. According to the company, the transmission may be shifted under any condition of speed or load without temporary lag or loss of speed and power. The development, known as a "screw shift," includes helical or spiral grooves, cut in main shaft which is the center of the mechanism. Action of the shift lever moves selector gears forward or backward along this spiral until they synchronize with the desired gear. Wright is now making the device available for use in ground and marine transport or stationary power plants requiring very quick changes in speed.

30,000-TON FORGING PRESS: Engine mounting brackets about 10 ft long and aircraft wheels more than a yard in diameter were forged on the 30,000-ton press the Germans put into operation late in 1943. Office of Technical Services, Washington, states the huge press, almost twice the size of the one reported in STEEL, June 17, p. 114, made an

aircraft wheel in two operations—one to flatten the blank and another to forge the wheel. The huge machine also turned out complex magnesium forgings such as supercharger rotors that required a minimum of machine finishing. Its total height is 80 ft, of which 27 ft is below floor level. It has eight columns, 31 in. diameter and eight cylinders 41 in. diameter with a 70-in. stroke. Ram and bed dimensions are 33 x 11 ft with a die opening of 9 ft. Stroke of the die shifting carriage is 25 ft.

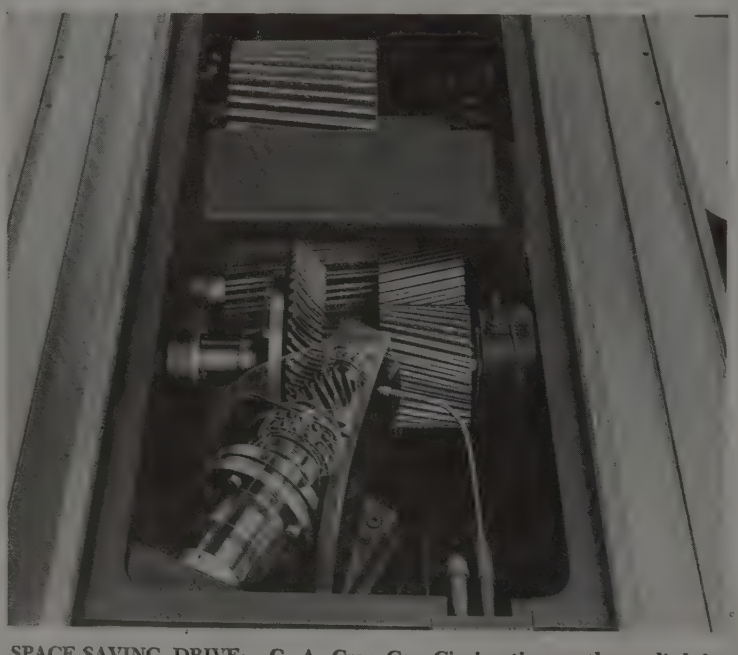
FLOATING ELECTRIC POWER: Westinghouse-built power plant incorporated in the Navy's latest 6000-ton floating dry dock, completed recently by Dravo Corp., Pittsburgh, consists of three 400 kw and one 150 w diesel-driven alternating-current generators together with their switchboards. It furnishes current to 40 motor-operated valves and 16 powerful pumps operated by 50-hp electric motors to submerge or float the dock by pumping ballast water at the rate of 96,000 gpm. The dock is equipped to provide direct current for ship's service through operation of the 150 kw motor-generator set. In addition to these major pieces of electrical equipment, the vessel carries a large number of smaller motors for driving pumps, compressors and deck auxiliaries.

MEASUREMENTS WITH ICE: Specific heats at high temperatures may be measured with great accuracy by a newly improved Bunsen ice calorimeter it is reported by the National Bureau of Standards, Washington. The development is said to be ideal in obtaining information on thermal properties of metals for metallurgical studies. While modern use of the instrument was largely relegated to the sensitive measurement of small amounts of heat, the new development, which is utilized in conjunction with a high-temperature electric furnace, makes possible the extension of the method to accurate measurement of large quantities of heat energy. In making heat determinations with the ice calorimeter, a capsule enclosed sample of material first is heated to a known temperature in the furnace, dropped into the ice calorimeter. in equilibrium with water in the coaxial of the glass vessel is pa melted by the heated material. R ant volume decrease draws mercury the closed system, with a correspo change in the amount of mercury weighed beaker—from which the energy absorbed by the ice is comp According to the bureau, accurat sults obtained with the instrume comparable to those provided by el devices.

CUTS REFRIGERATOR SERVIC Amount of water in Freon fluorin frigerants and certain other or gases and liquids can be measured an accuracy of one part per millio ploying a new infra-red techniq was reported in Atlantic City a American Chemical Society mee Refrigerator manufacturers, by the method to minimize moisture i frigerating systems, can make unit operate for 10 years without serv In determining moisture by the red technique, it was revealed, inv red light is passed through a transp cell filled with a sample to be t The device, which measures and matically records the intensity o light before and after it passes th the test cell, registers the amou moisture present on a calibrated An analysis can be made in 5 min the method.

COLORS ALL STEELS: All steels be colored to a deep, rich, blue-b including case and cyanide hard parts with the oxide coloring pr now being offered to industry by tective Coatings Inc., Detroit. The cess, which was developed originall the firearms industry as a gun-bl penetrates to a maximum depth 0.0001 to 0.0004-in.—depending the hardness of the metal, then from the inside out.

RAPID CALCULATOR: Yield str determinations of aluminum and alloys usually require two operator considerable time in plotting of s strain curves. Now they can be in a fraction of the time by one ator, using a new slide-rule type lator developed by Case School o plied Science, Cleveland, as part continuing research program for A num Research Institute, Chicago. new device gives tables and instru for rapid yield strength determin of aluminum alloys, brass, copper bon and low-alloy steels. Accura said to be on par with that of standard testing methods, accordi Case metallurgists.



SPACE-SAVING DRIVE: G. A. Gray Co., Cincinnati, recently applied for a patent on a planer drive that not only saves valuable floor space, but requires fewer gears, shafts and bearings to transmit power. Shown above, it makes use of hypoid gears in combination with helical gears and table rack to afford maximum load-carrying capacity with smoothness of action. Motor drives simplified gear train through a large diameter, tubular "floating shaft." Latter has flexible connections at both ends similar to the propeller shaft of an automobile. The connections do not require lubrication or create backlash. According to Gray, the floating shaft feature eliminates vibration and noise due to misalignment of motor, even if considerable misalignment exists. Development permits driving motor of a planer to be positioned behind the column or housing, close to the bed

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FABRICATES CASKETS OF

Chromium-Nickel Weldments

CHROMIUM-nickel alloy casket shells are being completely fabricated and assembled on a moving assembly line similar to that used in the manufacture of automobiles. Ryan Aeronautical Co., San Diego, Calif., has invested over $1 million in precision tools, dies and modern equipment to build an entirely new and distinctively designed casket by the most modern methods known today.

Use of chromium nickel alloy in casket shells offers modern protection and permanent durability. Recent National Bureau of Standards tests indicate that chromium-nickel alloy has many times the life of other casket metals and, when subjected to simulated burial tests, shows no signs of deterioration. Chromium nickel alloy used by Ryan for casket shell manufacturing has a tensile strength of 82,000 psi, which is between two and three times that of the metals in general use. This strength advantage is translated into a lighter weight casket. To further augment this strength, company designers have incorporated an all-welded, bridge-type construction in its design.

Every joint of the casket shell is electric arc welded with the same chromium-nickel alloy of which the casket itself is composed. This is a distinct contrast to the customary method of lead-soldering the joints in metal caskets.

To secure the maximum protection, no punctures are made in the casket shell after it is fabricated. This eliminates the need for sealing these holes and makes the casket a more complete structure. Handles on the shell are attached to a separate strip of chromium-nickel alloy which is welded to the outside of the casket body and no penetration is performed. First step in the process is the selection of the high quality chromium nickel alloy sheets that are free from impurities and surface flaws. Tiny imperfections can grow to rejectable blemishes under the severe stretching necessary for forming the ovaline lines of the casket shell. Acceptable material is then cut and tailored to size for the individual parts.

Most of the 150 parts are formed between polished Meehanite dies which are used in a 2 million lb press. The formed parts are cleaned and placed upon dollies which carry the parts through each work area. On the way, frames, panels bottoms and sealers are electric arc welded and assembled. To achieve contoured symmetry in the shell's design, 6 in. radius corners are formed for base and top.

Great care is taken to obtain a superior surface finish. Special solutions for removing dirt, grease and other impurities are applied as the casket shells move down the assembly line. The primer coats are sprayed on and quickly dried and cured in an infra-red drying tunnel. A seven-coat finish is used; every one of the coats is sanded, rubbed and polished before the next is applied. Glass-like smoothness is attained by employing both machine polishers and hand rubbing. At the final work area, the casket shell receives a careful inspection to see that it is perfect in every detail.

Top—Dollies are used to carry casket shells through various work areas. Here shells are being prepared for application of primer coats

Left—Frames, panels bottoms and sealers for the shell are fabricated by electric arc welding as parts begin to move down assembly line

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PHOTOGRAPH Courtesy The Elliott Company, Jeannette, Pa.

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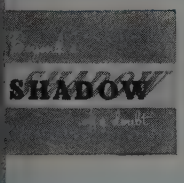

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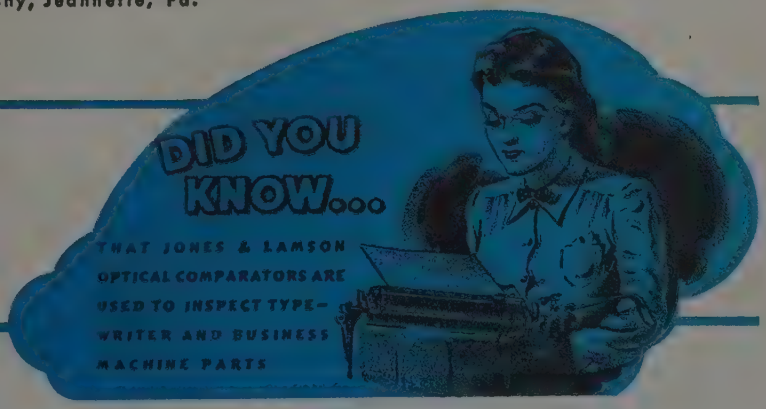

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MEASURING MILLIONTHS

with new British surface measuring instrument

IRREGULARITIES of the order of two millionths of an inch (microinches) may be easily discerned at a magnification of 20,000 to 1 with the Topograph, a surface measuring instrument of British invention. Operating on a simple pneumatic principle and giving a visable pen record of the surface profile along a selected straight track, the instrument facilitates diagrams showing these irregularities on a greatly enlarged scale.

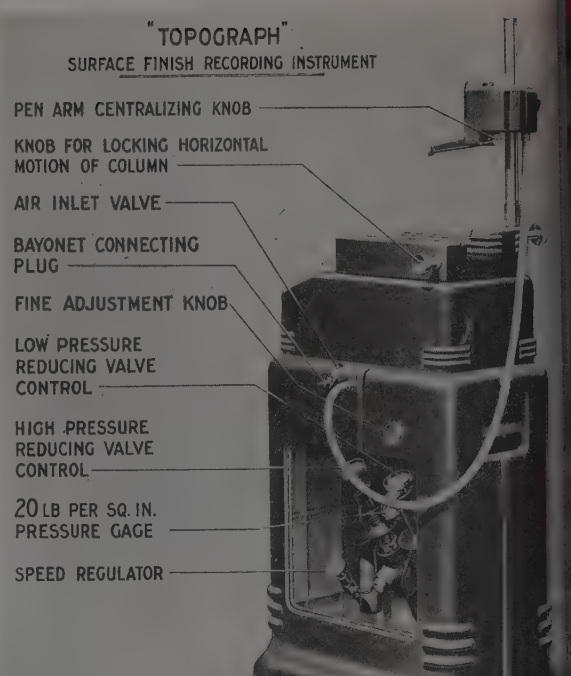
According to the designers of the instrument, David Brown Tool Co., a subsidiary of David Brown & Sons Ltd. of Huddersfield, England, standards of surface finish may be specified for various engineering purposes and, with the aid of the instrument, inspectors may actually check these finishes for production purposes. Normally intended for use on flat surfaces, it may also be applied to any curved surface that contains a straight line along which the tracer point may travel.

From the pen record the heights of the irregularities are directly determinable in millionths of an inch by multiplication by the particular conversion factor for which the instrument is set.

The projecting end of the tracer arm is provided with a spherically-mounted skid resting on the surface to be tested. The tracer point passes through the center of the skid and is held in contact by a light spring exerting a force of only a few milligrams. Carried on the short arm of a lever, is the tracer point and on the other end is a vane which partially intercepts a jet of air directed at an orifice 0.046-in. in diameter.

Pressure built up at this orifice is conveyed to a relay which applies proportional pressure to a spring-loaded diaphragm operating the pen. The ratio of pen movement to tracer movement is adjustable between 5000 to 1 and 20,000 to 1. Air pressure between 35 and 90 psi is required for operation of the instrument.

The tracer skid is transversed by hydraulic pressure exerted on the tracer arm. The motive power comes from a falling weight which acts as a piston to force oil through a valve adjusted to give a suitable speed of descent. In falling, the weight rotates a roller which draws a continuous paper chart beneath the recording pen. At the same time the descending weight proportionately compresses a metal bellows connected by a flexible pipe to a similar bellows which in turn gives motion to the tracer arm. Normal speed of traverse over the work is 0.033 ipm.


"TOPOGRAPH"
SURFACE FINISH RECORDING INSTRUMENT
PEN ARM CENTRALIZING KNOB
KNOB FOR LOCKING HORIZONTAL MOTION OF COLUMN
AIR INLET VALVE
BAYONET CONNECTING PLUG
FINE ADJUSTMENT KNOB
LOW PRESSURE REDUCING VALVE CONTROL
HIGH PRESSURE REDUCING VALVE CONTROL
20 LB PER SQ. IN. PRESSURE GAGE
SPEED REGULATOR

Industrial Research Institute Set Up in Texas

Abundantly equipped research laboratories, organized into an integrated scientific unit are being built as the Foundation of Applied Research and Institute of Industrial Research near San Antonio, Tex. Begun by Thomas B. Slick through the gift of valuable oil property, the organization is eventually intended to be self-supporting, doing research work in agriculture, natural sciences, medicine as well as industrial research.

In the industrial field, research will be in two sections, covering petroleum engineering, metallurgy, chemistry and physics, among others. The section will operate on a fee basis, serving particular industries desiring aid on special technical problems. An invention development service is to be set up to assist deserving inventors to bring about completion of inventions which, without financial and other aides, would not be developed.

ASM Master Standard Covers Electrical Symbols

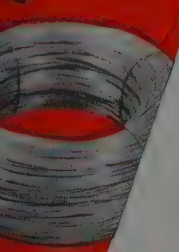
"Basic Graphical Symbols for Electric Apparatus" is the subject of a standard sponsored by American Institute of Electrical Engineers and American Society of Mechanical Engineers, issued by American Standards Association, New York. Bearing the number Z32.12-1947, it is a master standard covering symbols used in drawings employed in wide sectors of the electrical field.

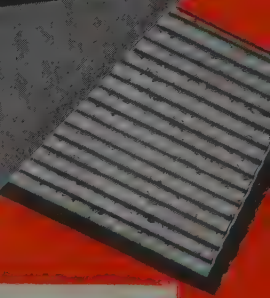
Standard provides "building blocks" consisting of 152 basic symbols for electrical drawings, which in combinations may be used to describe on electrical diagrams an almost endless variety of circuits and other electrical devices, the association states. It is described as a "master" standard as it covers basic graphical symbols and their components in the power, electrical control and communications fields.

—o—

An 82-lb heavy duty paving breaker with oil economy assured by a metering device which furnishes proper lubrication for all working parts, is announced by Ingersoll-Rand Co., Phillipsburg, N. J. A kicker port valve increases striking power and efficiency of the machine. Features include block type piston, long anvil block bearing and a long handle. It may be converted to a pile or spike driver.

Tops FOR THINGS MADE OF STEEL





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Extetior and interior views of completed weld-fabricated sandwich shop ready for shipment

"PACKAGE" WELDS

Stainless Steel and Aluminum Shops

WELDING plays an important role in the construction of prefabricated stainless steel and aluminum sandwich shops currently manufactured and distributed via rail and trailer by Valentine Industries Inc., Wichita, Kans. It not only enables the company to deliver each structure as a complete unit to the ultimate location site—with counter and stools, and even shelves already erected—but also provides it with sufficient strength and rigidity to withstand the strain imposed by cross-country shipping.

Six-inch channel members, rigidly welded at the corners, are used as the base frame of each 24 x 10-ft building. Floor joists consist of 4-in. channels welded to the base frame. These are positioned at 2-ft intervals across the 10-ft width of the structure. Twenty-gage steel sheets, interlocking in design, serve as sidewalls. The panels are welded to the base frame and to adjoining panels at 6-in. intervals. They also are joined to the top angle ring, a 2 x 3-in. angle. Besides providing a stiffener for the wall panels, the ring serves as a base for roof panels which also are fabricated from 20-gage steel sheets.

Roof panels are welded securely to the 2-in. leg of the top angle ring and to each other in a manner similar to the welding of the wall panels. Ceiling panel flanges, which have a 4-in. drop in 9 ft, are filled with about 4 in. of metallic insulation. Same insulation is used in the four walls of the building. Laps in the insulation board laid across the roof panel flanges are covered with 4-in. metal strips. Corrugated roofing is used on top of the insulation board, and flashing is provided at the front and back.

Parapet of the building is fastened directly to wall panels, the metal roofing being faired into the parapet. Twenty-gage steel sheet also is used for the floor of the building and is welded to the channel floor joists. Window frames consist of an inner and outer angle of sheet-steel stock, the inner frame being of stainless steel. A 2 x 3-in. angle, welded to the top ring and to the base frame, is used to reinforce the panel above each window frame and the panels to either side of it. Glass is installed with spring clips and caulked. An extrusion screwed to the outside of the frame holds the glass in place. Drive screws are used to fasten the insulating material, ½-in. sheet rock, to the panel walls. Latter is covered with light-gage aluminum sheeting. To provide attractive finishing for the interior of the shop, synthetic enamel is sprayed on all panels, and a trimming of snap-on stainless steel is used.

Welding also is extensively employed to build the shop fixtures. The range is fabricated by flame-cutting and arc welding. Sheet metal portions of the stove and smoke hood are stainless steel. The sheets are formed with a curved edge and rounded corners to provide stiffness necessary to maintain the structure, at the same time eliminating overlapping joints and sharp corners. Stainless steel clad plate, welded to the stove frame is used as the griddle. Use of clad plates provides a stainless surface for cooking, backed up with a heavy mild steel plant to withstand the heat of a continuous fire. Fabrication of a 14-cu ft mechanical refrigerator and a floor cooler by welding stainless steel sheets is another advancement scored by the manufacturer.

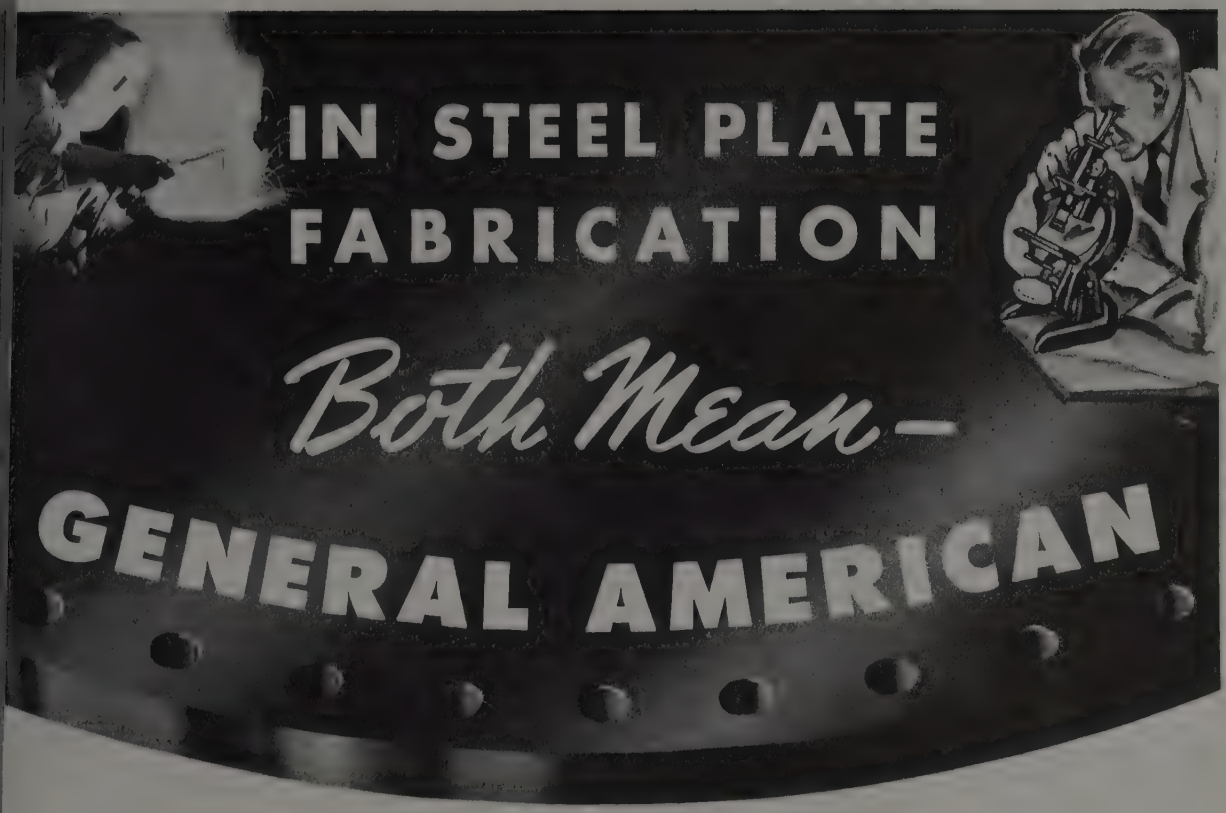
According to Lincoln Electric Co., which supplied the shielded arc welding equipment used in most of the joining operations, unit parts for the shops are fabricated by H & H Parts Co., Wichita.

Air Used To Control Power Shovel Operation

Incorporating air control and air-cushion clutches into their design, model 71 power shovels, draglines, clamshells, cranes, backhoes and other combinations, made by Osgood Co. of Marion, O., are readily changeable from any of these classes of service to another in the field.

According to the company, the use of air for controlling and clutching means quiet, efficient and economical operation of the machinery producing the hoisting, crowding, swinging, traveling and steering motions.

Operation effort is said to be slight, the panel of short throw levers which control metering air valves being located within easy reach. The air-cushion clutch, said to be new in the field, has but one working part which reportedly requires no adjustment.



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GATX GENERAL AMERICAN

New Tandem Cold Mill

ROLLS STRIP at MILE-A-MINUTE

First of new fast mills placed in production at Weirton is designed with individually driven work rolls. Acceleration from 500 fpm threading speed to 4000 fpm rolling speed attained in 9 sec. Mill handles 15-ton coils

By J. C. SULLIVAN
Pittsburgh Editor, STEEL

WORLD'S largest and fastest cold-reduction mill is now in operation at Weirton Steel Co., Weirton, W. Va. The new mill is a 42-in. 5-stand, 4-high tandem unit, capable of rolling strip up to 5000 fpm. This operating pace is one-third faster than the previous record and almost three times as fast as most cold-reduction mills now in operation. About four of these overweight fast mills now are under construction for other companies, while contracts for still additional units are scheduled to be placed soon.

Owners of this new mile-a-minute mill built by United Engineering & Foundry Co.) will convert rounds of strip steel to tin plate gages, from 0.006 to 0.015-in. thick although the mill is capable of rolling up to 25 gage strip. Full scale operation of this unit is not scheduled until additional power generating facilities are available around July 15.

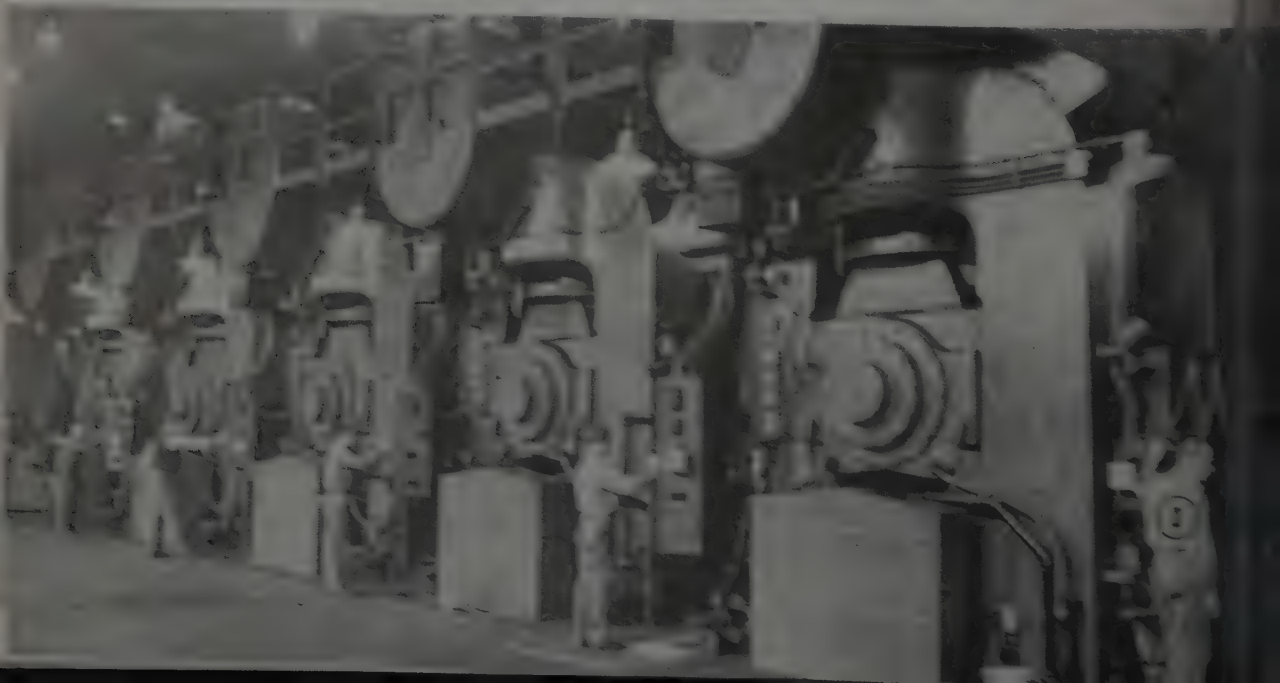
The mill will make possible a 50 per cent increase in Weirton's theoretical tin plate capacity to about 1.8 million net tons annually. To immediately accomplish this, however, the zinc electroplating line will have to be turned over to electrolytic tinning operations, and present electrolytic lines will have to be speeded up.

One of the most unusual features of this mill is the method and equipment by which it is powered. The combined input of direct power for rolling is 3500 hp.

The No. 1, 2 and 3 stands are directly connected through a pinion stand to the work rolls, and powered as follows: No. 1 stand with a 1750 hp single armature motor, 0-70-210 rpm.; No. 2 stand by a 3500 hp single armature motor, 0-125-312.5 rpm; and No. 3 stand

Fig. 1—Front end of coil of strip being fed into the first stand of rolls

Fig. 2—Side view of new 5-stand, 4-high cold strip mill which is brought to an emergency stop in 4 sec



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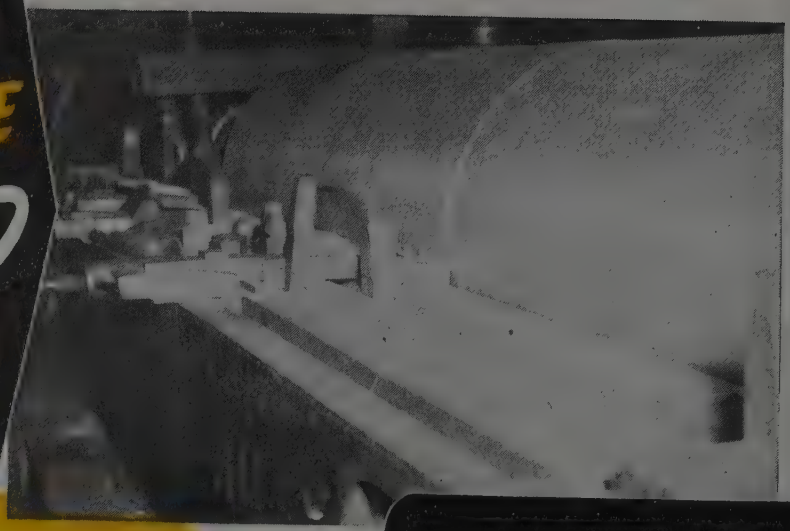

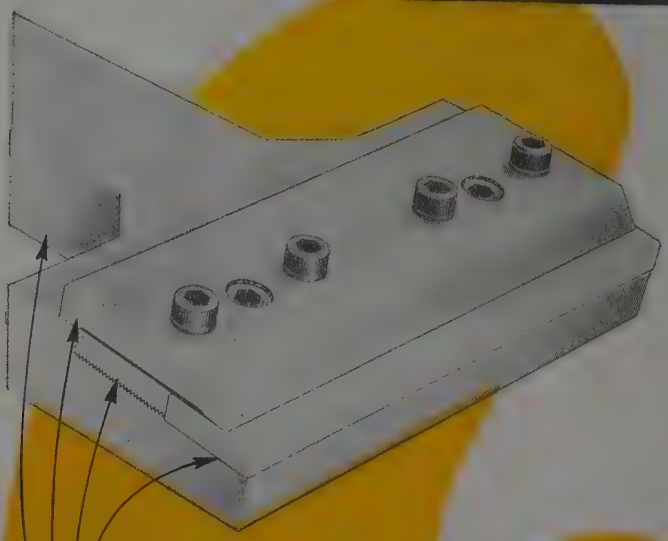

- Rugged, solid Kennametal Blade . . . hard, strong Grade K6; clamped-in, advanceable, four cutting edges.
- Shank, clamp, and back-up plate are heat-treated steel.

Available in four sizes — cutting widths of blades: 4", 6", 8", and 10".

"UNMACHINABLE" CHILLED CAST-IRON ROLLS

[UP TO 90 SCLEROSCOPE]

CAN NOW BE TURNED with the NEW

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A sturdy Kennametal Grade K6 blade is securely held in place on an accurate surface of the supporting shank by a clamp and serrated, advanceable back-up plate—each of hardened steel.

The blade has four cutting edges that may be used in succession before any sharpening is required. Then it can be reground time and again (long sides only) and advanced each time to cutting position, until ⅔ of it has been utilized.

There's one positive way to prove this new Kennametal tool can greatly reduce your cast-iron roll production costs—and that's under actual working conditions in your shop. We'll demonstrate—invite us.

*For example, a roll that required 25 hours for rough grinding was turned with two 8" Kennametal Tools in 8½ hours.

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KENNAMETAL Inc., LATROBE, PA.

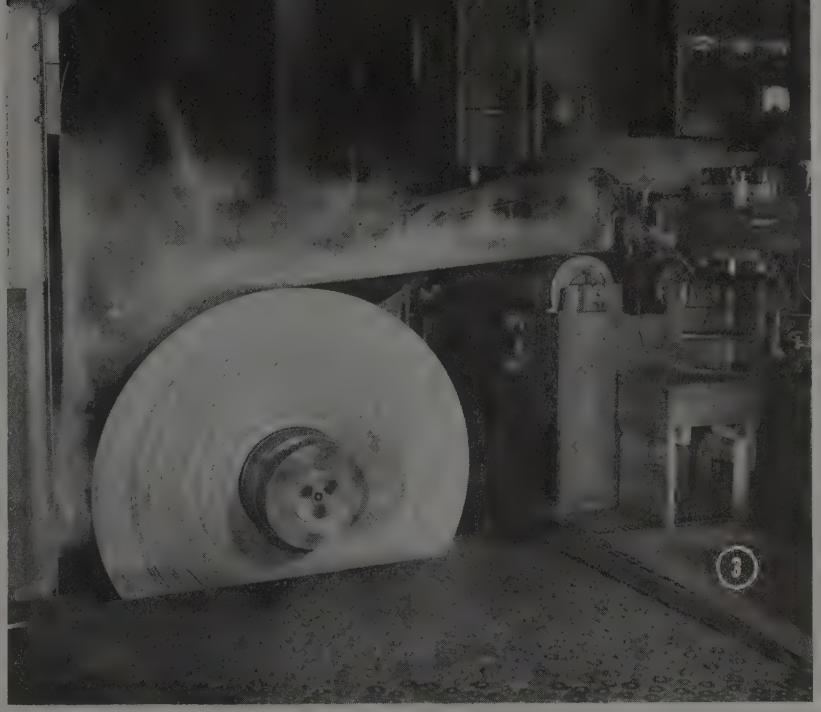


Fig. 3—Winding reel at end of mill traveling 5000 fpm

uble armature 3500 hp motor, 0/225-
0 rpm. The No. 4 stand is powered
two 1750 hp motors (0/225/450
) which are single armature with
peed up gear assembly that has a
of 1.55 to 1. The No. 5 stand has
same setup as the No. 4 stand, but
owered with two 2250 hp motors,
250/450 rpm) single armature and
a speed up gear assembly which has
to 1 gear ratio. The winding reel
owered by two 400 hp motors in
dem.

peed of the rolls is synchronized
ugh the mechanical action of both
s gripping the same piece of strip
l, and through electrical control of
division of power load between the
motors. This is said to be the first
e in history of strip steel produc-
that work rolls have been individually
en by their own motors on high-speed
l-reduction mills of this type.

t an operating speed of 5000 fpm,
speeds of the individual stands are
ollows: No. 1 stand, 650 ft (one-half
in as fast as maximum finishing speeds
older cold-reduction mills); No. 2,
0 ft; No. 3, 2100 ft; No. 4, 3200 ft;
No. 5 stand, 5000 ft. Operating
eds of the mill will obviously depend
thickness of strip entering and leav-
the mill, the relative draft of these
nds, and size of rolls used.

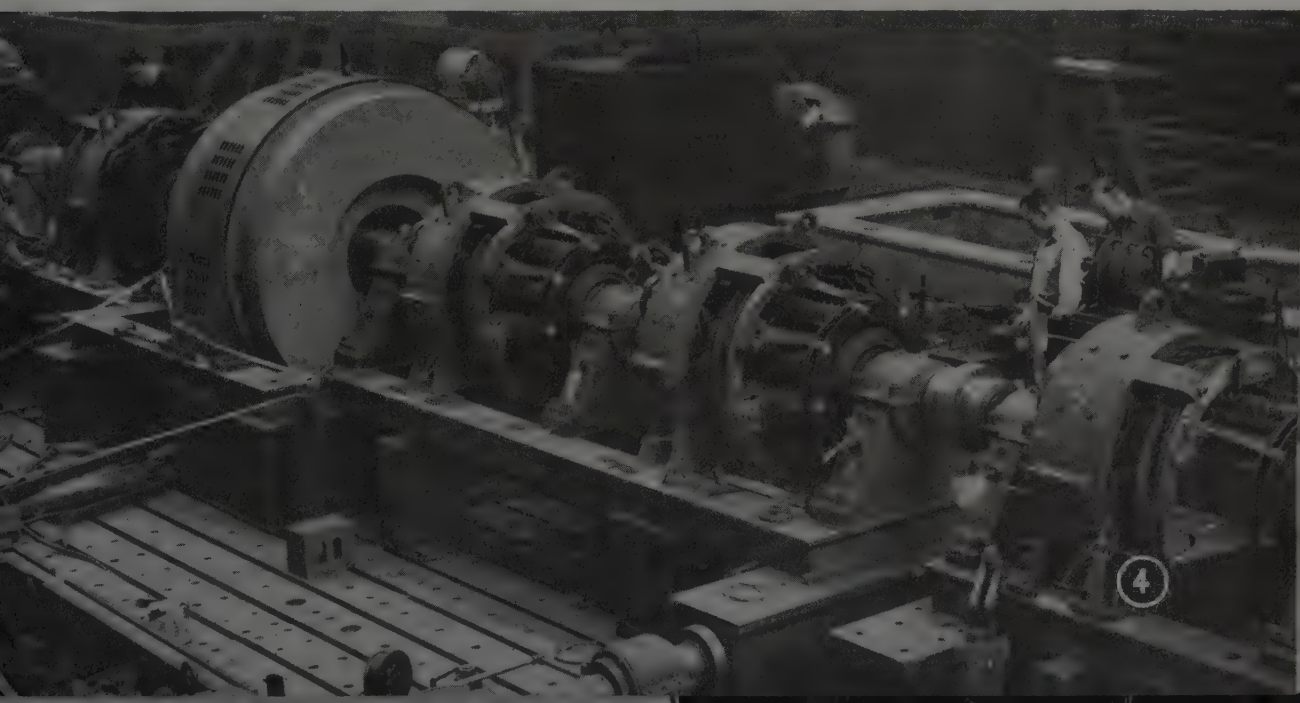
Once the fpm speed of each stand
set according to rolling schedule de-
d, the system of I-R drop compensat-
boosters and demagnetizing exciters
intain matched stand speeds. This
angement provides a constant speed
ationship between all the stands from
eading to running.

Each electrical motor on the new mill (made by Westinghouse Electric Corp.) was designed for a speed range suitable for the stand it is to drive. This speed range makes possible the co-ordination of the rolling speeds of each five stands. Normal mill practice has been altered in this high-speed mill through the use of direct drive motors on the first three stands, and step-up gears on the fourth and fifth stands.

Motors were so designed that inertia of the rolls is always in proper relative values, so when speed is increased or decreased the tension of the strip between the stands is maintained in proper relationship. It was necessary to design the motors for acceleration and deceleration inertia to operate in connection with inertia of the drive, spindles, backup rolls and working rolls. Once the mill speeds are set and the proper compensation set on the boosters, it is contended that acceleration and deceleration can be made without loss in relative strip tensions.

Between each two stands are four tension rolls equipped with indicating tensiometers—an electrical device for measuring tension of the strip between successive stands. The tensiometers give an exact measure of total tension be-

Fig. 4—Motor-generator set with 1500-hp main driving motor and seven booster generators and three exciters. Ouput of this unit is fed into the big motors driving the mill



tween stands which was formerly estimated by striking the edges of the strip with a stick to determine tautness. The tension between the fifth stand and winding reel is maintained by a regulating tensiometer whose movement is magnified through a Rototrol generator which in turn reflects on the winding reel motor field strength. Tensiometers have been supplied which indicate maximum tension between first and second stands of 60,000 lb, and taper down to 25,000 lb between stands 4 and 5.

The mill is capable of making an emergency stop from 5000 fpm in about 4 sec, by using a field forcing exciter to hasten the lowering of the generator voltage. This rapid deceleration is essential due to the extremely high speed the mill operates. Production experience to date also has shown the mill is capable of accelerating from a threading speed of 500 fpm to 4000 fpm rolling speed in approximately 9 sec.

Power for the motors is supplied by two motor-generator sets located directly behind the motors. Each set consists of two 3500 kw d-c generators and a 9900 hp 6600-v motor. The purpose of the motor-generator sets is to change alternating current to the direct current necessary for mill operation. In addition to these two main motor-generator sets, there is an auxiliary set located in mill basement. This set consists of 11 units and is powered by a 1500 hp 6600-v motor. The auxiliary set includes I-R boosters for mill stand motors, generator exciter, reel booster, and master exciter.

Also located in mill basement are the indicating meter board and electrostatic air cleaner. There are 108 meters on the board which show how all electrical equipment is operating. The air cleaner is one of the largest industrial installations of this type, rated at about 378,000 cfm.

To provide additional power requirements created by the new mill, a substation is being constructed near the strip steel plant. A new 25,000 kw (31,250 kva) turbogenerator is being installed at the main power plant located at the steel works. A 22 kv transmission line will carry the power from the new turbogenerator to the strip steel plant. New high-pressure boiler will provide steam for the generator. This unit has a rated capacity of 325,000 lb per hour, at 825-psi pressure and 850° F.

Vibration Kept at a Minimum

The mill's foundation is 50 per cent heavier than for less fast units. Other steps to reduce vibration include extremely heavy bed plates, heavy housings, large roll mounts and rolls, and large heavy screw down. Static and dynamic balancing have been employed to keep vibration to a minimum.

The 10 housings in the mill's five stands weigh 104 tons each, which is more than the weight of the housings of many mills of other types which seem larger because the stands are spaced a greater distance apart. Each housing post was thoroughly machined to make sure there were no casting defects.

Backup rolls are 53 in. diameter and 41 in. long; work rolls are 21 in. diameter and 42 in. long. Each stand is equipped with a high-speed screwdown power with two 50 hp motors which have speed range of 550/1375 rpm, spec compound wound. These screwdow permit quick adjustment of the mill a speedy roll changes.

Weight and mass of this mill are hig ly important. Flexibility of "spring" reduced to a minimum permitting work rolls to bear on the steel with steady, even pressure at all times. T mill is so quiet in operation that it difficult to believe it is rolling steel an unprecedented speed.

A new elevated conveyor to transf coils from the picklers to the new m is now under construction and will completed in near future. This co veyor will be 575 ft long and construct to handle 60 coils weighing 30,000 each—a total of 900 tons.

At the entering end of this mile-a-mi ute mill is an uncoiler which feeds t strip into the unit and is operated b a hydraulic system which also contro the winding reel coil stripper. The wo and backup rolls are held in balance b a roll-balance hydraulic system; a sep rate system is used for the balance the spindle carriers. Through this ro balance system the work rolls are he in contact with the backup rolls. Th hydraulic systems account for some the maze of piping on the mill. Oth pipes carry water and lubricants.

Two lubricating systems serve the ge drives, screwdowns and pinions. One lubricating system is used on the fi two stands, another on last three. A 100° F, the oil viscosity for Nos. 1 an 2 stands ranges between 1600 to 170 sec; on last three stands, betwee 800 to 900 sec. There are also tw lubricating systems for the Morgoil bea ings. Temperature of the oil for th bearings is kept below 110° F, and with in a range of 5 degrees.

A palm oil system is also used on th mill which consists of the usual circula ing, proportioning and feeder pump By means of grooved rolls underneat the strip, palm oil is spread on the botto of the strip under controlled temperatur These grooved rolls have the advantag of picking up more oil and spreading i

Strip temperature is controlled with a range of 100° F.

Winding reel coils have an inside d ameter of 16.5 in. to a maximum of 66 i outside diameter. The coil is weighe automatically. Maximum size coil, u der present practice, weighs 30,000 and contains 5 miles of strip for th lighter gages. A system of guides, plu a belt wrapper, facilitates the threadin of the strip from the mill on to th winding reel, thus making possible highe threading speeds.

Winding reel maintains a constant ten

NEW LITERATURE

QUALITY CONTROL, SETTING UP A TYPICAL CASE
By North American Philips Co. Inc., 100 East 42nd street, New York 17. Four-page bulletin contains two chart illustrations and text material.

HIGH SPEED STEEL WELDING RODS
By Welding Equipment & Supply Co., 223 Leib street, Detroit 7. Six-page folder graphically illustrates and gives physical properties, heat-treatment and uses of Eureka No. 2 high speed steel welding rods.

FOUNDRY MECHANIZATION
By Allis-Chalmers Mfg. Co., Milwaukee, Wis. Bulletin No. 07B6092A is a 20-page illustrated booklet that provides an insight into equipment used in a wide range of foundry operations from light and heavy jobbing to mass production.

DESIGN FOR PROGRESS
By James F. Lincoln Arc Welding Foundation, Cleveland 1. Four-page pamphlet contains rules for the Design-for-Progress program sponsored by the foundation.

CLEAN AIR
By Division of Labor Standards, U. S. Department of Labor, Washington 25, D. C. Pamphlet contains a description of reaction of lungs and air passages to dusty atmosphere and the limitations of the body defenses for combatting dust.

MATERIALS HANDLING NEWS
By Clark Tructractor, Battle Creek, Mich. Well-illustrated, the booklet contains special articles on the company's new developments.

CEMENTED CARBIDE PRODUCTS
By Kennametal Inc., Latrobe, Pa. Catalog 47 lists and describes seven new products in the company's line.

LOCK WASHERS
By Shakeproof Inc., 2501 North Keeler avenue, Chicago 39. Bulletin No. 8 is a four-page folder giving practical applications that suggest better locking methods for various products.

EARTHMOVING EQUIPMENT
By Trackson Co., Milwaukee 1, Wis. Folder describes new Model T6 Traxcavator, gives features and specifications.

ROTARY MACHINE
By National Supply Co., P. O. Box 899A, Toledo 1, O. Bulletin No. 340 contains sectional views, blue prints, explosion photographs and complete specifications of Ideal SHS-20½ rotary machine.

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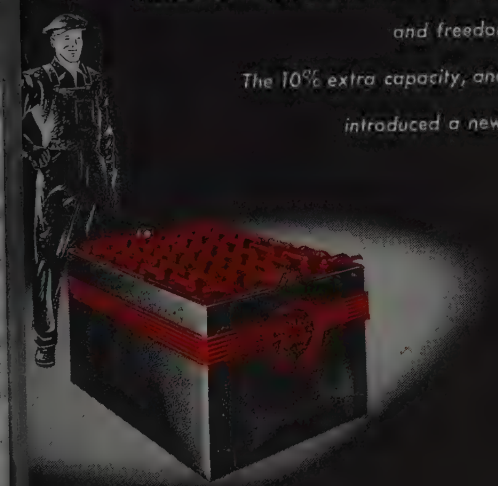

PHILCO
STORAGE BATTERIES

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sion on the strip which is governed by a tensiometer. Unlike the other tensiometers on the mill, this is an automatic regulating device. If the coil is to build up evenly as the strip leaves the mill, the speed of the winding reel must be reduced as the outside diameter of the coil increases. This slowing down of the reel sometimes creates the optical illusion that the mill is operating at a slower speed.

Still in service at Weirton are some mills that are pioneers in technique of cold rolling. One of these is the No. 2 mill which was built in 1926 and placed in operation in 1927 and the old 48-in. hot-strip mill. The No. 2 mill is a 2-stand tandem unit with a speed of 230 fpm—its original speed. It now rolls heavy gage sheets 0.030 to 0.125-in thick. The No. 1 and 3 mills, also built in 1926, are 4-stand tandem mills. Speed of both mills is 450 fpm, after rebuilding in 1933, in gage range 0.0086 to 0.125-in. The No. 1 mill produces cold-rolled sheets and galvanizing material; No. 3 unit produces these materials and also steel for tin plate.

Company's No. 5 mill is a 4-stand tandem unit and produces material for light-gage sheets and tin plate. The No. 4 mill was built in 1934 with an original speed of 600 fpm. Not long after it was in operation the speed was stepped-up to 1000 fpm; and in 1939 again increased to 2500 fpm without changing either rolls or housings. This unit also produces material for light gage sheets and for tin plate.

Bearing Numbering System Offered to ASA

A standardized numbering system for ball and roller bearing dimensions was recently presented to the American Standards Association by the Anti-Friction Bearing Manufacturers Association. The new code calls for a common means of identifying types, sizes, tolerances, modification of internal design and lubrication of standard ball and roller bearings to meet all the requirements of bearing users.

New system utilizes a combination of figures and letters alternately and is flexible enough to take care of future changes in design, tolerances, lubricants and separator materials. It is semidescriptive rather than a dead code. It was pointed out that the industry's new numbering system permits the expression of more variable descriptions in terms of four digits, whereas the Army-Navy numbering system must resort to the use of digits. This is expected to be of spec value to the manufacturers of bearin in the small size range.

Handling Trucks Reduce Costs

Handling trucks built by Baker Indu trial Truck Division of Baker-Raula Co., Cleveland, played an importa part in the manufacture of the Gre Northern railway's completely new Em pire Builder.

At Pullman-Standard Car Mfg. C Chicago, where the cars for the tra were built, the trucks form the basis the plant's modern, mechanized handli system—speeding intra-plant moveme of materials and releasing men fro handling duties for productive work.

According to Pullman's superintender the trucks are estimated to save at lea 80 per cent in handling costs by kee ing materials flowing between the com pany's various buildings scattered ov a wide area, by their flexibility in ta ing materials from flat cars, box cars highway trucks, and by saving floor spac in tiering operations.

Automatic Welding Boosts Hydraulic Lift Production

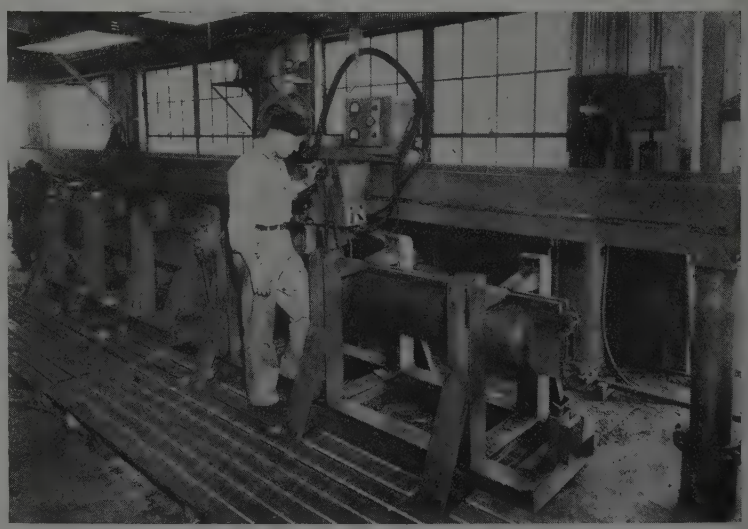
AUTOMATIC shielded arc welding is said to have accelerated production of hydraulic auto lifts by more than six times at Rotary Lift Co., Memphis, Tenn. Cylindrical casings as shown in the accompanying illustration are automatically welded by machine installed on a special rig—a boom having both ends set on hydraulic lifts —which give vertical mobility to the welding assembly.

Hourly Output Increased

Casings are made of ¼-in. rolled steel, 93 in. long and having a diameter varying from 11 to 20 in. With the initiation of automatic welding, using equipment manufactured by Lincoln Electric Co., Cleveland, output was increased from two to 12 pieces per hour, each job having a penetration of 100 per cent.

Double jig allows the welder's helper to load and unload one casing while the machine is welding the casing on the other jig. Air pressure of 50 lb is applied to the underside of the copper back-up bar. Granular flux is deposited by the welding machine between parallel bars, along the lateral joint on the casing. Arc travel speed on this operation is 36 in. per min, with a 5/32-in. electrode at 650 amp and 32 v.

When completed the casings contain piston and oil assembly of the same type hydraulic rig that is used in garages and lubritoriums.



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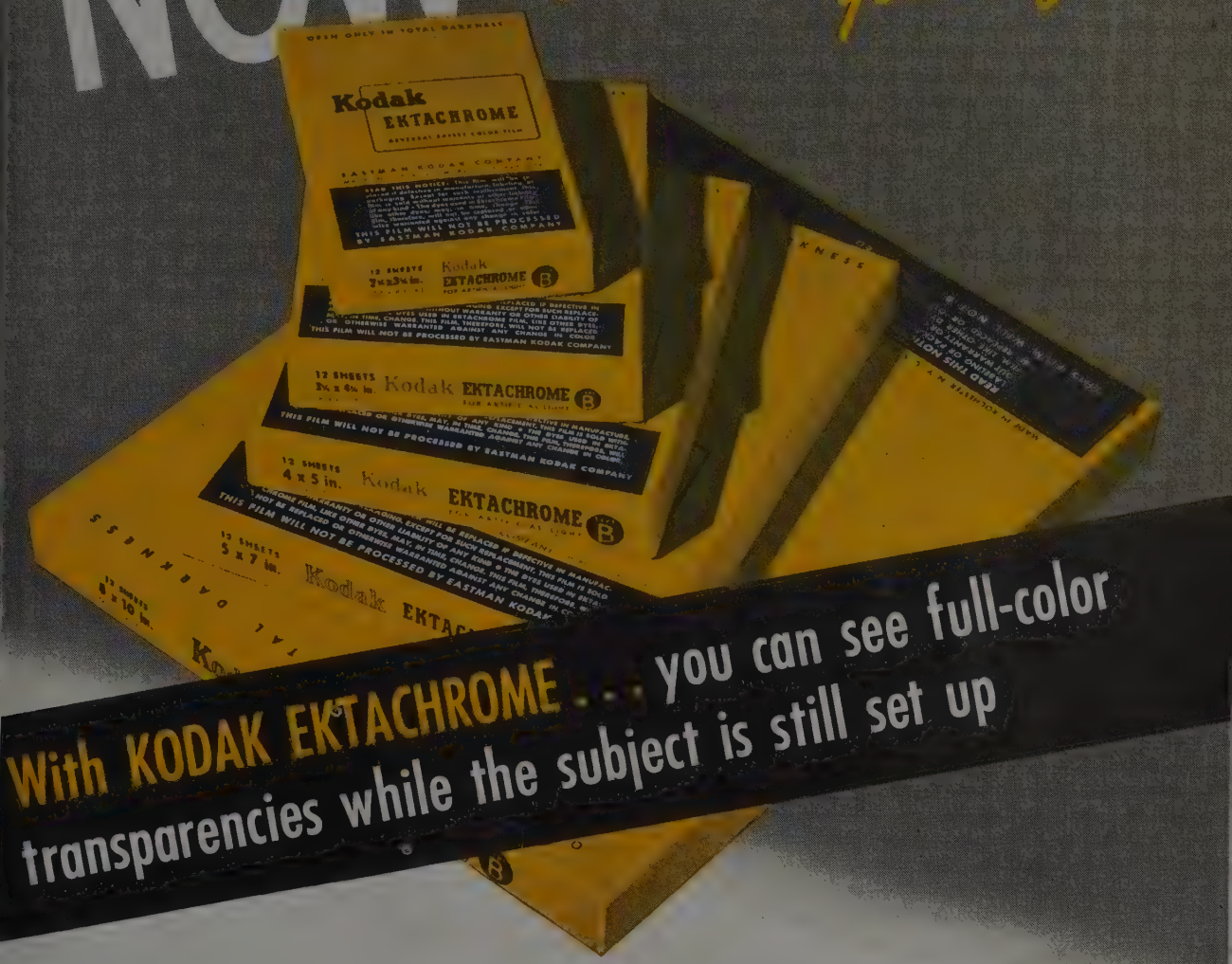

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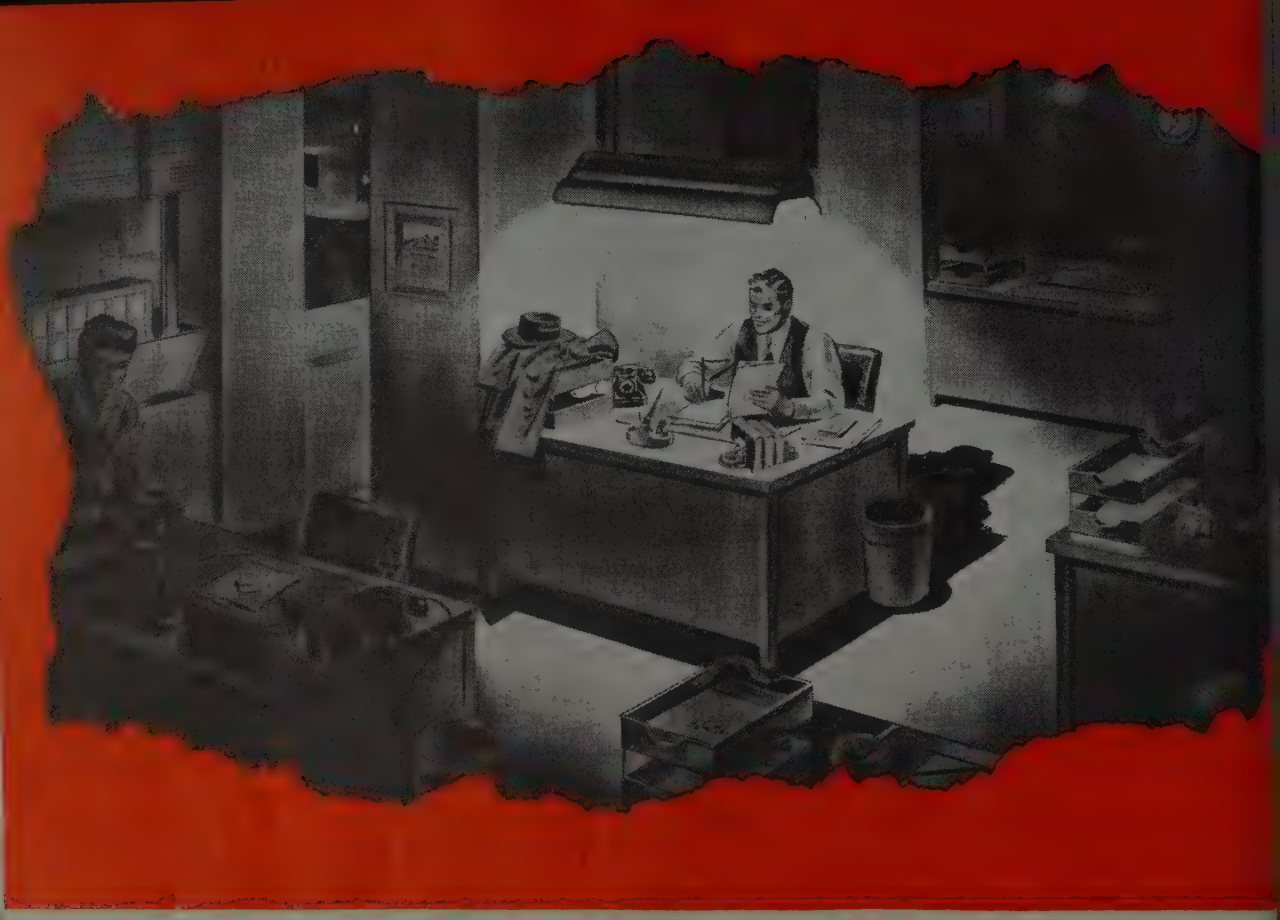

Good work, Bill—Employers Mutuals like to pay claims promptly

Bill Sanders is regular. He, too, likes to settle the claim of a policyholder—promptly.

Bill is specially trained to carry out Employers Mutuals fundamental policy of operating for the benefit of policyholders. Like practically all E-M claim adjusters, he is directly employed by Employers Mutuals.

Bill knows why Employers Mutuals like to pay claims. He knows that prompt settlement of claims creates enduring friendship for his companies.

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Bill is proud of Employers Mutuals—proud to be a part of this group that is conservatively managed, ably directed, and soundly progressive in ideas and ideals.

And Employers Mutuals are proud of Bill and all their men like him. The continued commendation of fairness and promptness in settling claims is all they need as evidence of the valuable service these men perform for Employers Mutuals and for E-M policyholders.

Because they operate solely to benefit their policyholders, Employers Mutuals like to pay claims—promptly.

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The story of an idea that worked its way up to a national reputation

PROMPT claim settlement is only one example of the far-reaching effects of an idea as simple as the Golden Rule.

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Employers Mutuals can save you money

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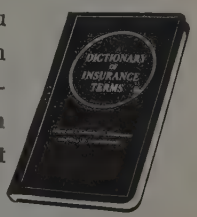
Or write for full information on workmen's compensation, fire, public liability, or any of the allied lines of insurance. We will include "A Dictionary of Insurance Terms" to help you understand insurance. Write—on your business letterhead, please—to: **Insurance Information Bureau, Employers Mutuals of Wausau, Wausau, Wis.**



EMPLOYERS MUTUALS of WAUSAU

. . . MAKE INSURANCE UNDERSTANDABLE

Zinc Alloy Dies

(*Continued from Page* 105)

present peculiar problems which tax the ingenuity and experience of the best designers. It is not an exaggeration to state that each design is a problem in itself. First of all, the metal to be formed itself has to be studied—its composition and characteristics, size and gage.

There are few specific rules for the behavior of metal in a drawing operation. A particular type and size of sheet may react in what appears to be an entirely different manner from another, in drawing operations which vary only slightly one from the other. This is also true of sheets of different sizes and shapes. The variation in behavior becomes even more pronounced at the slightest change in the composition, internal structure, and physical characteristics of the metal being worked.

Most important factor governing the design of a die has to do with the flow characteristics or plasticity of the metal. This involves not only the correct positioning of the male member, or punch, but also the development of draw ring contours to avoid uneven stretching of the blank under tension, and to avoid elongation beyond a prescribed point within the elastic limit of the sheet. Pressure, too, is a factor influencing behavior of sheet metal under tension. This, however, is not of prime importance in design as pressure characteristics can be determined only during tryout by varying the pressure here and there between the draw rings, and applying draw beads and grooves where their need is indicated.

Experimental work is still being carried on with Kirksite A in an endeavor further to improve its physical characteristics. The ultimate strength that may be attained cannot be stated; however, at the present time, this material does not seem suited for use in conventional punch press coining, and embossing operations. A method of blanking and forming sheet steel parts in a special process employing rubber will be discussed later.

Suitable for Drawing and Forming Dies

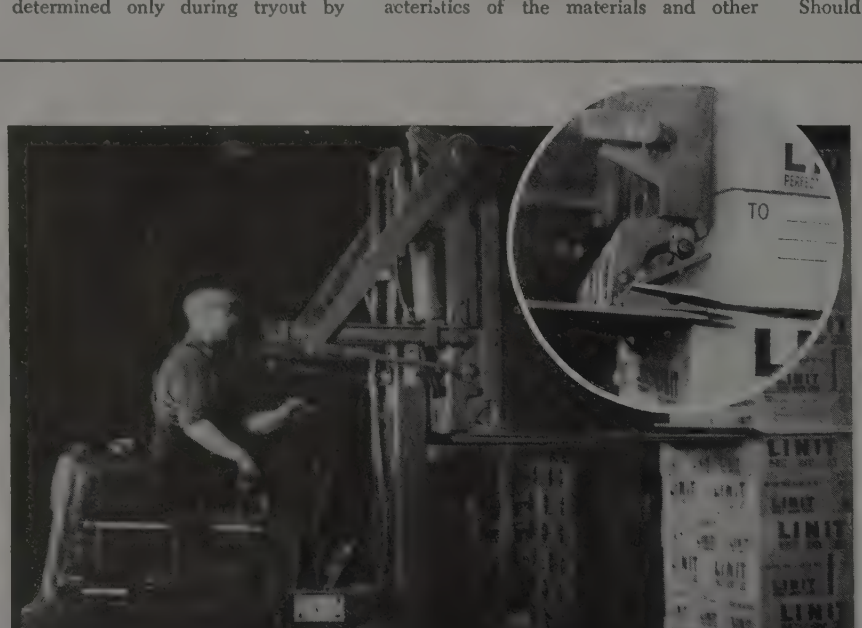
The special zinc alloy first was used extensively as a material for forming and drawing dies in conventional presses by the Detroit Fisher Body Division, and as some 8000 dies have been designed, cast and used in drawing aluminum panels, there can be little doubt as to its suitability for this purpose.

Generally speaking, there is much similarity between dies of conventional materials and those for which Kirksite may be substituted. Designing problems, accordingly, are also similar excepting the detailed differences dictated by the materials used. This can be explained one way by stating that the method of working the pressed metal and, therefore, the type of die that is used, will be the same in either case. However, due to the difference in physical characteristics of the materials and other factors, the die components when mad of the special zinc alloy must be heavie generally, than those made of cast iro or steel, in order to compensate for thes differences.

Furthermore, in the design of cast iro components, it is often an advantage t core out the castings extensively as means of material economy and to re duce porosity. Neither of these reason generally applies in the case of Kirksit as the material can be reused, and co ing interferes with the uniform shrink age of the material during solidificatio The Fisher Body Division has cored ce tain die components successfully but ha resorted to this practice only for th purpose of reducing weight in large unit having a length in excess of 6 to 8 ft.

Knowing the physical characteristic of the alloy, the designer may come t the conclusion ferrous inserts are re quired in every instance where shar corner radii are encountered. It ha been found in actual practice, howeve that Kirksite has an inherent plasticit which causes it to flow temporarily to ward sharp edges while under pressure When the contour of the die is such tha there is sufficient metal in a critical area it may be found that the use of harde materials is not essential in all cases.

This does not imply such inserts ar not effective when experience indicate their necessity to overcome wear o breakdown. If they are to be used, i should be decided whether the insert are to be cast into the die or added later Should it be the latter, recesses for the



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inserts, and keyways if necessary, can be provided in the casting to eliminate machining. In either event, a detail drawing of the insert should be provided so that it can be ordered from the machine shop at the time patterns are being made.

When inserts are cast in the die, provision is made for locking them in position by inserting long bolts into the metal to the proper holding depth. When properly positioned in the mold, the melted alloy then flows around the protruding shank and head of the bolts and solidifies, thus holding the insert firmly in position.

Behavior of sheet steel being drawn from between binder rings into a die cavity is somewhat different with specializing alloy dies than with those of cast iron and steel. A much closer draw ring adjustment must be made to eliminate either wrinkling because of insufficient pressure, or too rapid wear on the ring surfaces through excessive pressure. As this cannot be completely regulated in the press because of play in the adjusting mechanism, equalizer blocks or steel spacers are placed between the upper and lower draw rings, which will control the spacing and pressure within close limits.

The designer, accordingly, must provide for and position such equalizer blocks when drafting the die design. Generally, these are placed at each corner of the die, but in larger dies or in those with irregular contours additional blocks may be desirable. Actually, equalizer blocks are fitted after the die surfaces have been matched up or "spotted in", provision being made for fitting blocks by milling off the four corners other positions on the die componen The actual spacing usually employed 0.003-in. over the thickness of the sto

When dies for new stampings are be drafted for the first time, as a gene rule the designer does not attempt pla ment of draw beads and grooves in binder rings. It is found more pract able to make these additions during t out, as usually various adjustme must be made before a satisfactory s ting can be found for the specific jo However, past experience with simi stampings may indicate accurately wh such beads are required, and it is th desirable to show them on the desig In this case, both the beads and groo can be cast directly the labor of finishi the die, providing the patterns are ma accurately.

CARRIES ORE CROSS-COUNTRY: Iron ore, coal and other bulky materials will travel over long distances on this rubber-fabric belt, shown here receiving finishing touches as it emerges from a vulcanizing press at the Passaic, N. J. plant of United States Rubber Co. Fabricated of nylon and Ustex yarn, the belt is said to be 250 to 400 per cent stronger than previous belts of its type

Insert Holes Cast to Size

Another marked difference betwe Kirksite and iron and steel dies is th handling holes or insert holes can cast to accurate size in the former. it is softer than conventional materia thread holes for eyebolts and inserts w be larger and deeper. It has been fou through experience that such holes shou be drilled and threaded to a depth twice the diameter of the anchoring scre or bolt.

Material from which the product to be made must be considered, course, as well as the method of oper tion and type of equipment. Due differences in impact and tens strengths, aluminum, brass, copper, ir and steel will not react in the same w to identical tools. To avoid gougin piling up, tearing and fractures, t radii of the tools may have to be change or even a different type of operatio devised to assure the same general resu

There are many variations also, in t internal structure of each class of m terial, depending on its chemical co position. A considerable difference exis between the toughness, hardness a flow characteristics of cold rolled ste and some of the alloy steels, for exampl

The same may be said of aluminu zinc and their alloys, as evidenced the case of pure zinc versus the Kirksi zinc alloy.

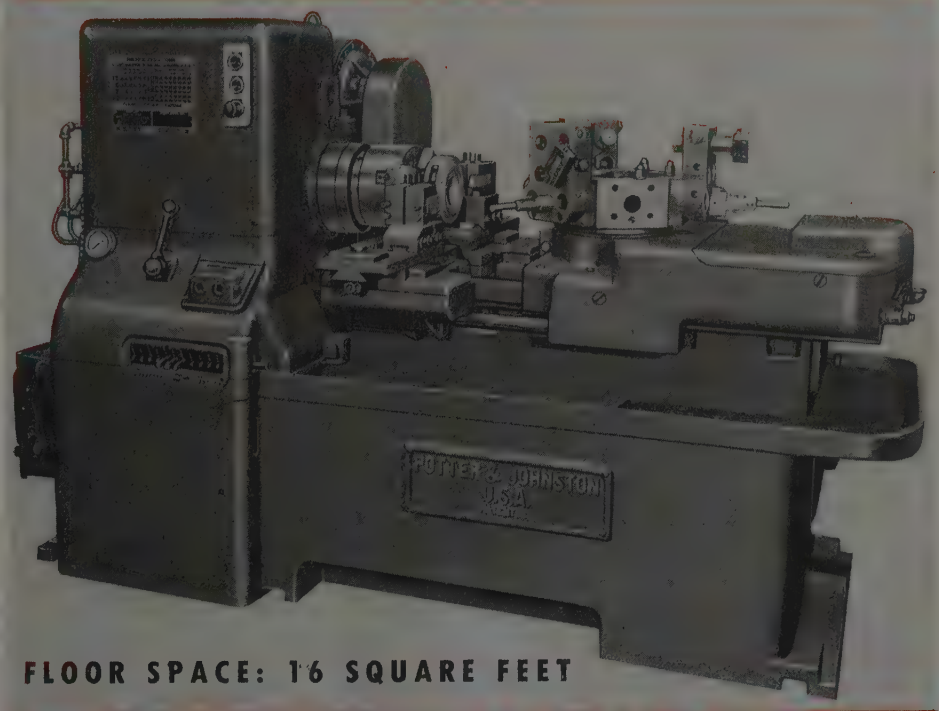
Finally, the gage or thickness of t material to be worked may influence t decision as to both the method and t equipment to be used. Thicker meta may require slower punch press oper tion backed up by proportionately great pressure, or may not yield at all to t same treatment accorded the light gages.

Since the size and shape of the ca die depends on the form of the patter

Split second timing

change from rapid traverse to working feed, or vice versa

The new Potter & Johnston 3-U Automatic Turret Lathe highlights speed, accuracy and timing. P. & J. Automatics have time and again demonstrated their superiority over hand machines, and the new 3-U is no exception. Because of its speed and accuracy, cost per piece is lowered, in spite of greatly increased hourly pay for operators. The new 3-U has 48 changes of speed between 36-711 RPM and 73-1445 RPM, and these speeds are arranged in six sets of four automatic changes. Continuing on the subject of speed, this newest Potter & Johnston Automatic Turret Lathe has the power and speed demanded by carbide tooling; improved chucking arrangements give greater gripping power and quicker loading and unloading of work—and the machine makes a complete cycle of operations in 24 seconds! For quality of finished product and increased output at reduced labor cost, the 3-U P. & J. Automatic Turret Lathe has no superior. Its many qualities and the claims we make for it invite investigation, particularly if you are considering the selection of machines for the production line.



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the role of the patternmaker ranks ne in importance to that of the designe To begin with, the designer is concerne with the end result only and the desig therefore, is drawn to the exact size the finished die. As a result, the patter maker must fabricate the pattern in ove size dimensions to allow for shrinkag of the alloy during solidification. Agai while the cast die component may b in one piece, the pattern may compris a number of different pieces, i.e. th basic form, attachments, inserts, core etc. Finally, the machining time require to finish the die depends on the accurac of the pattern.

Numerous methods of making pattern for Kirksite dies are in use. An all-woo pattern may be made for a single cast ing or for use as a master pattern model In the aircraft industry, which employ relatively simple dies in drop hamme work, all plaster patterns predominate For the more complicated draw dies which may have three or four com ponents, a combination of both wood an plaster has the widest application.

Wood for Patternmaking

Normally, white pine is satisfactor for patternmaking, but other woods hav ing stable and easy working character istics will prove suitable. For patter work, the wood must be seasoned an dry and have a moisture content of n more than 4 to 7 per cent. Plaster fo molding patterns should have a minimum shrinkage factor upon solidification an should be uniform in texture so tha each batch, given the same treatment, will produce the same results. Plaster i mixed in the ratio of 65 lb of plaste to 100 lb of water.

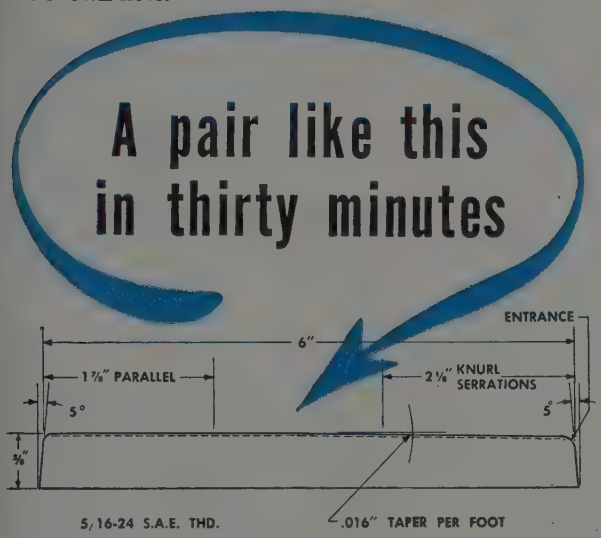
Whether all plaster or combinatio wood and plaster patterns are being made, plaster sections should be rein forced with New Zealand flax, hemp, manila, jute, sisal or other long fiber material. A handful or "bat" of the loose fiber is taken at a time, and after being partially separated and roughly flattened, it is immersed in the plaster mixture and then laid on the layer of plaster first applied to the form. When dry, the fiber serves not only to reinforce the pattern but also to lighten it.

There are two schools of thought in regard to protecting patterns—the first believes that no protection should be given; and the second that all patterns should be shellacked or even metallized. Patterns made with standard setting plaster are subject to minor exterior damage in handling and some protection is afforded by coating the pattern with three or four thin coats of orange shellac, clear lacquer or even white paint, with proper allowance time for drying between coats. Orange shellac should

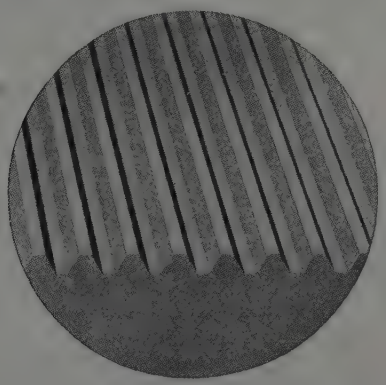
GRIND thread rolling dies?

...the answer is YES!

Now—through a new application of THOMPSON TRUFORMING—you can produce accurate duplicate roll thread dies and eliminate subsequent corrective operations formerly required. An example is the roll thread die shown here.



This is the Stationary Die (a perfect mate to the Moving Die not shown). Both were ground on a THOMPSON TRUFORM grinder from heat-treated alloy steel in less than thirty minutes. Note the radii, the precise taper and flat section. This is produced with a single cut—to full depth of thread form without resetting.



Enlarged tooth section shows form of threads and helix angle. By TRUFORMING dies are perfectly matched . . . there is no distortion.

Deformities are eliminated by TRUFORMING because work is finished right in hardened steel. Note the special forming fixture in the photograph, which makes possible completely automatic and highly accurate grinding of the longitudinal contour. These Thompson die grinding features are new with patents applied for.

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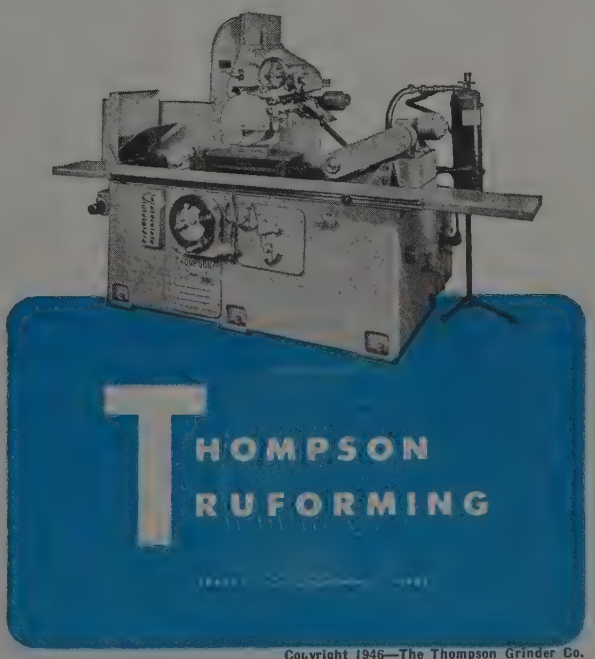

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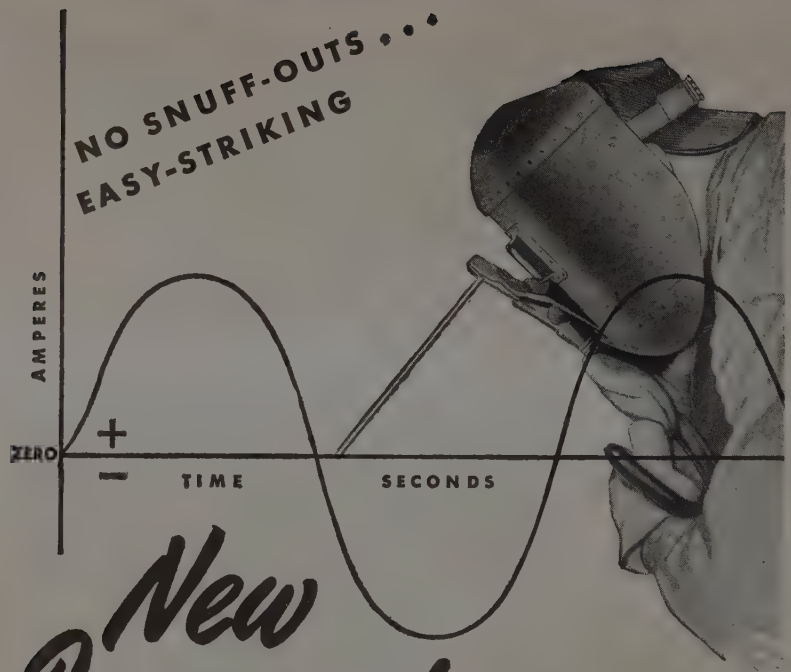

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be used, as white shellac attracts moisture, or "sweats", and adheres to the sand.

As moisture is already present in plaster when first applied, such coatings protect the pattern from external moisture and are effective from this standpoint on all wood patterns only. In a combination wood and plaster pattern, some of the moisture in the plaster pattern will penetrate the wood while the plaster is setting and, therefore, warpage in some degree may be expected over a period of time. In the same way, metallizing a pattern is resorted to only for protection against external damage and in order to provide a wear resistant surface if the pattern is to be used a number of times.

Kirksite and similar alloys have a uniform shrinkage value of 0.14-in. per foot during solidification as compared with 0.125-in. for zinc. The importance of a known shrinkage value, of course, lies in the fact that the exact casting size can be predetermined and, therefore, machining operations are eliminated.

Shrinkage Allowances

Theoretically, the shrinkage of equal amounts of Kirksite poured at identical temperatures will be the same. In practice, however, it has been found that castings poured into molds formed from patterns made with the recommended shrinkage allowance, apparently do not come out to the size prescribed. This is believed to be due partly to variations in pouring temperatures. For instance, it is to be expected that the density of the molten alloy should increase slightly as its temperature approaches the melting or solidification point. The principal factor in shrinkage variations, however, is believed to lie in the characteristics of the molding sand employed; that is, the amount of alloy poured into the die cavity depends on the resistance of the sand to packing under the hydrostatic pressure.

As a result, shrinkage allowances which are or have been employed in various pattern shops, are in the order of 1/10, 7/64, 1/8, or 9/64-in. In general, the tendency has been toward lower allowances as experience has been gained. While it is impossible to set a standard applicable under all conditions, it may be stated that an allowance of ⅛-in. usually has been satisfactory on small and medium sized work.

Once a standard shrinkage allowance is established, there are two ways of taking this factor into consideration when fabricating die patterns. Preferably, artificial rules or yardsticks should be made up in these oversize dimensions, but if this method leads into too many complications, standard measuring devices

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may be used and all dimensions increased at the rate established per foot.

A punch pattern, after being allowed to dry and then shellacked, is ready to serve as a pattern for a plaster take-off of the opposite or female section of the die, if one is required. This section is formed by first ruling, or scribing off that area of the punch form which represents the panel and comes into contact with the work, and erecting a fence of molding clay or plywood around the delineated area. The fence serves two purposes; first, it confines the plaster that will be used; and second, it shapes the walls of the pattern. Corresponding with the die drawing, the fence should be high enough to permit covering the highest point on the punch to a depth of 3½-in.

Preparation of Pattern

The punch panel section and the fence are first coated with stearic acid blended with kerosene, and then covered with a coat of prepared plaster to a depth of at least ½-in. Then care should be taken that air bubbles are not trapped under the plaster, which will mar the pattern surface. Next, the plaster is reinforced with a 1-in. layer of plaster impregnated fiber bats. If an all plaster pattern is required, this procedure is repeated, alternate layers of plaster and impregnated fiber being placed in the form until it is filled to within ½-in. of its total depth. The base is finally finished off in clear plaster.

If a pattern is of large dimensions, in order to reduce weight, a box frame is fabricated from wood pieces cut to wall dimensions. The walls are not permitted to rest on the punch pattern surface however, being cut back approximately 1-in. to allow for finishing off in plaster. The edges and inside walls near the surface of the pattern are studded with nails as a means of anchoring the plaster facing. In a number of industries, full scale models or "mock-ups" are made of new or revised products before the design is finally approved, and occasionally these are so constructed that they are suitable for patternmaking purposes.

So far, it has been assumed that a draw die assembly consists of four components: A male form or punch, an opposite or female member and two matching draw rings. Although it has been pointed out that the female member and a draw ring may be cast as a single unit, this number of components however, is not always required. If the panel to be drawn has a surface without depressions, embossing or reverse curves only a punch and two draw rings are needed as the metal will form over the punch without aid of a female section.

When the die is of the form described

Rockford Hy-Draulic Shaper-Planer with special Duplicating Unit. Master cam (1) on rail, reproduces contour of work-piece (2) in vise.

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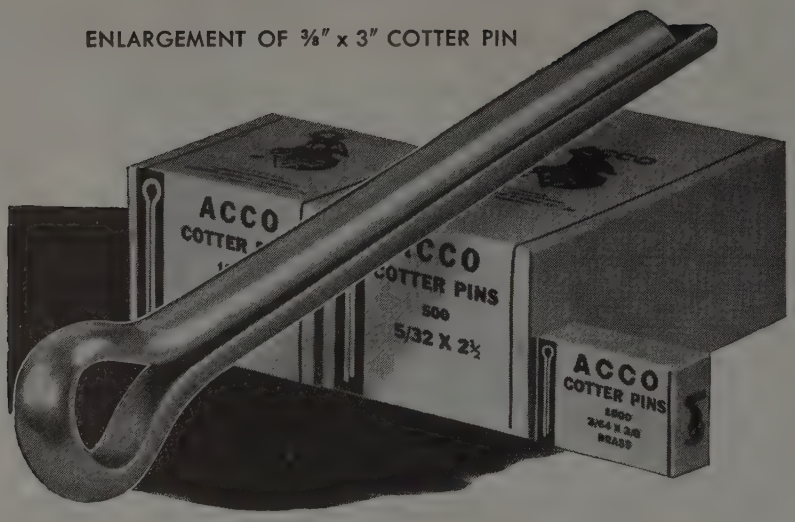
ENLARGEMENT OF 3/8" x 3" COTTER PIN



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above, the aperture in the ring into which the metal is drawn can be left completely open. The opening may be reinforced with the addition of ribs, or the cavity in the bottom may be completely enclosed, depending on requirements. If ribbed or left solid to provide for rigidity or to prevent warping during casting, the reinforcing surface is cut back below the full depth of the draw to eliminate machining and finishing.

The fourth member of a draw die is necessary, chiefly, when a secondary forming operation is involved such as the creation of beads, indentations or embossments for strengthening the panel; or when compound curves are encountered. As previously noted, the fourth member can be dispensed with if the female or opposite form is incorporated into one of the draw rings. This instead of being solid, can be of skeletal structure, or if the formation is at points adjacent to the edge of the panel, the female formation can be incorporated as a projection, or step, into the draw ring with the balance of the opening left entirely open, ribbed or completely enclosed as the occasion warrants.

Ring Surface Designed to Grip Metal

The fact of the draw or binder rings which hold the sheet metal while it is being drawn, generally does not follow the contour of the punch. It is a prime objective that the shape of the draw ring surfaces be designed to grip the sheet metal and control its flow into the die cavity in a manner which will permit the maximum uniformity of stretching well within the elastic limit of the material and all points. It is customary practice to make one draw ring pattern entirely in wood and to repreduce the face of the opposite ring in plaster using the all wood pattern as a master. The technique involved in making the wood pattern requires no further explanation, as this is made to design dimensions plus an appropriate shrinkage allowance, unless the nature of the stamping requires that the contours be fashioned on the pattern.

The opposite member requires wooden construction for the base, leader pin bosses and other features that cannot be produced by a plaster take-off. The face, or blank holding surface, is cut back approximately 1-in., from finished dimensions and this is studded with nails to provide an anchor for the plaster which will subsequently form the finished face.

When circular patterns are required, much time can be saved by adopting the "sweep method" of patternmaking. This consists essentially of utilizing a metal template whose inner face corresponds with the outer contour of the pattern to be formed. The template, connected

to a pivot in the center of the pattern, is used literally to sweep the pattern into shape.

Kirksite wall sections can be one-third less in thickness than pure zinc due to the alloy's greater strength. In comparison with cast iron, however, die walls should be at least one-third wider to avoid distortion or springing under pressure.

Draft is the bevel given to the pattern walls so that the pattern may be drawn from the mold without injuring it. This should be at least one degree from vertical and some authorities recommend 3/64-in. per ft of depth on an average, or even more in the case of patterns having cavities of 6 in. or less. All pattern walls, both interior and exterior, should have the same draft as otherwise the pattern cannot be withdrawn evenly from the mold and the walls of the mold will be damaged.

Allowance for Metal Clearance

Where the nature of the die requires an allowance for metal clearance between component parts of the pattern, a method used by the aircraft industry is to utilize wax, rolled to the metal thickness, as a spacer between the pattern and the opposite part which is being cast in plaster. This practice is not recommended on full wood patterns for spotting the opposite member, as a more satisfactory result can be obtained when the proper clearance is determined during tryout.

Cast dies require considerable handling at the time they are being surfaced and in subsequent machining and tryout operations. When a die has only two components, receiving holes for eyebolts or locking devices which can be used to balance the dies while they are being moved may be cast in the die walls. The patternmaker should indicate on the pattern where these holes are to appear and the molding department will provide them.

In order to do this, a corresponding hole in the mold is cut out and baked sand cores are inserted which protrude into the die cavity a distance corresponding to the depth of the eyebolt hole. As such sand cores will crush as the casting shrinks, they are made of the same diameter as the eyebolts to be used and the metal shrinkage will assure a tight fit.

It has been found more convenient in some foundries to substitute tapered steel pins for baked cores. These pins are of such a size that the diameters of their small ends are slightly less than those of the bolt to be used in lifting the die, thus providing a wedging action which secures the bolts firmly in the casting. The pins are shellacked and rolled in sand

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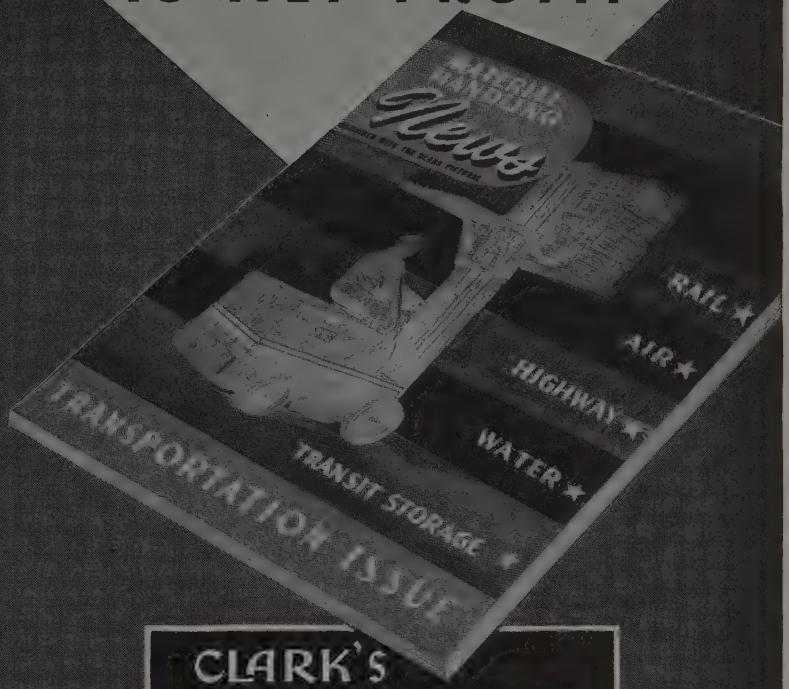

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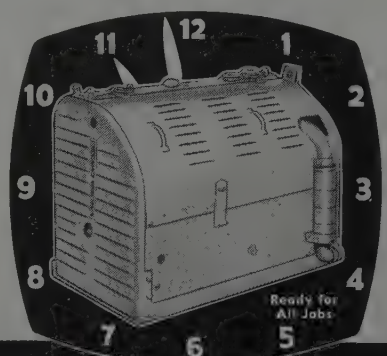

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before setting in the sand mold with the thin end extending into the cavity. After the casting has cooled, they may be knocked out easily. When the alloy flows into the die cavity, it flows around the baked sand cores or steel pins, whichever are used, and after the casting is cooled removal of the cores provides the holes required.

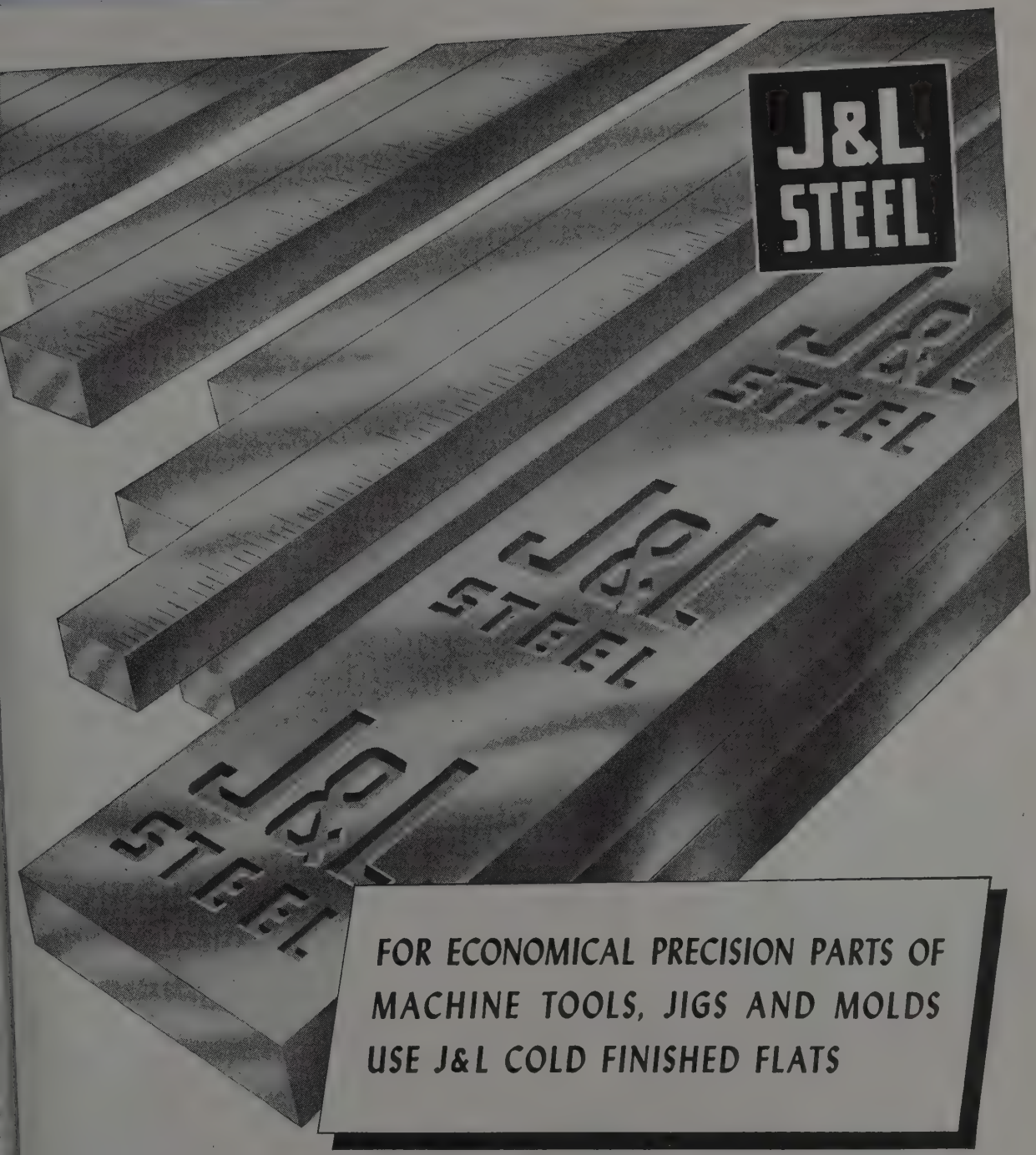
When a die has four components, eyebolts in the central members are impracticable as they intefere with the rings. In this case, deeper receiving holes should be provided for the insertion of unthreaded lifting bars. On the ring members, the pattern may include lugs for chain hoists only. Depending on the technical capacity of the molding department, it is the practice of some foundries for the patternmaking department to omit the more common attachments such as chain lugs, lifts, ledges, bosses, etc. These are provided in the molding department by the use of standard core boxes or wooden blocks, which are placed in their proper position in the die cavity.

Provisions for Holes in Castings

In addition to providing for holes which are to appear in the casting, the pattern department must provide holes at each corner of the pattern base. These are used for positioning eyebolts which will be used to withdraw the pattern from the sand mold. In casting draw rings, baked cores may be used to represent the central die component; that is, to fill the punch opening space. These cores should be made with an additional core or pocket within themselves, which is filled with cinders and sealed over with oil sand. Such core boxes are used in place of molding sand as they crush during solidification, permitting the rings to shrink uniformly without side wall stretching stresses.

It is a characteristic of Kirksite and similar die materials that the slightest mark on the pattern will be reproduced on the casting. The grain of the wood, sandpaper scratches, or even pencil marks, on the pattern will reappear on the casting. Great care, therefore, must be taken that all extraneous marks are eradicated before the pattern is turned over to the foundry.

This factor has two advantages, however. Obviously, it is less expensive to make corrections in wood or plaster than in metal, so if the patterns are made accurately and checked carefully, errors in the casting can be prevented before they occur. Secondly, trim, quarter, or other instruction lines can be penciled or scribed on the pattern which, reproducing themselves on the casting, act in lieu of an operation sheet to the die finishing department.



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Diesel Engine Parts

(*Continued from Page* 108)

head is then mounted on the bar. Absolute alignment and rigidity are insured by having the bar piloted through a second bushing placed in another bore. An action photograph of this setup appears herewith as Fig. 6.

While one of the floor type machines performs facing operations on the main bearing, the second mills the end surfaces of the engine block, as shown by Fig. 4. Traverse of the machine on its runway enables the operator to mill the width of the block with each forward and reverse pass of the machine. After milling, various holes are drilled, reamed and tapped, and camshaft holes are bored and faced.

The entire cycle of operations performed by the first machine on one side and one end of the engine weldment is duplicated by the second machine on the opposite side and opposite end of the block.

Occasionally it is necessary to replace worn main bearings after an engine has been in service for a considerable length of time. In the repair shop, a method similar to that used in facing bearing cheeks is followed. Any table, floor or planer type horizontal boring machine is well adapted to this type of work. Here is the procedure. Those bearings nearest the one damaged are bushed to receive the bar. Then the replaced bearing is finish bored to dimensional accuracy. Should more than one bearing need reboring, the nearest support bushing should then be moved to the bore just completed. In this way, one, two, three or even more main bearings can be dealt with without the use of a special holding fixture for the bar.

Adaptability of the horizontal boring machine for a variety of operations is clearly demonstrated by the practices involved in machining the crankshaft bearing saddle for one of the same types of diesel engines. A planer-type horizontal boring, drilling and milling machine equipped with an additional headstock, column and an auxiliary table is used. This machine is illustrated in Fig. 7. The added headstock makes it possible to perform operations on the opposite side of the block without breaking the setup. An auxiliary table supports the work, giving the machine added capacity as well as increased working range.

After the caps are assembled, the boring bar is "threaded" through the bearing holes and two support fixtures as pictured in Fig. 3. The auxiliary supports—at center and at left in Fig. 3—serve the dual purpose of preventing bar sag and maintaining of all bores.

A line boring bar with block cutte is used. These are ground to size in t tool room and are quickly inserted the bar. Rapid changing of cutter bloc makes it a simple matter to rough, sem finish and finish bore the bearing sea No time is lost in cut-and-try method

To speed production of positive pre sure blower housings for the diesel scavenging system, a table type horizo tal boring, drilling and milling machi is equipped with the special boring hea pictured in Fig. 2. This special hea completes the lower impeller bore fir The illustration shows the start of th operation. Then, by raising the machi headstock, the boring tool is correct positioned for completing the upper i peller bore. After these two bores a completed, and without resetting t blower housing, the special boring hea is removed from the bar and the air i let and outlet passages are bored.

A combination of headstock and tab movement rapidly and accurately pos tions the work for these successive o erations. Center distances for all bor are determined to close limits by machi scales and verniers. Obviously, it is simple matter to remove the boring too used in these operations and repla them with milling cutters to face t housing. This method of machini insures surface matching for inner a

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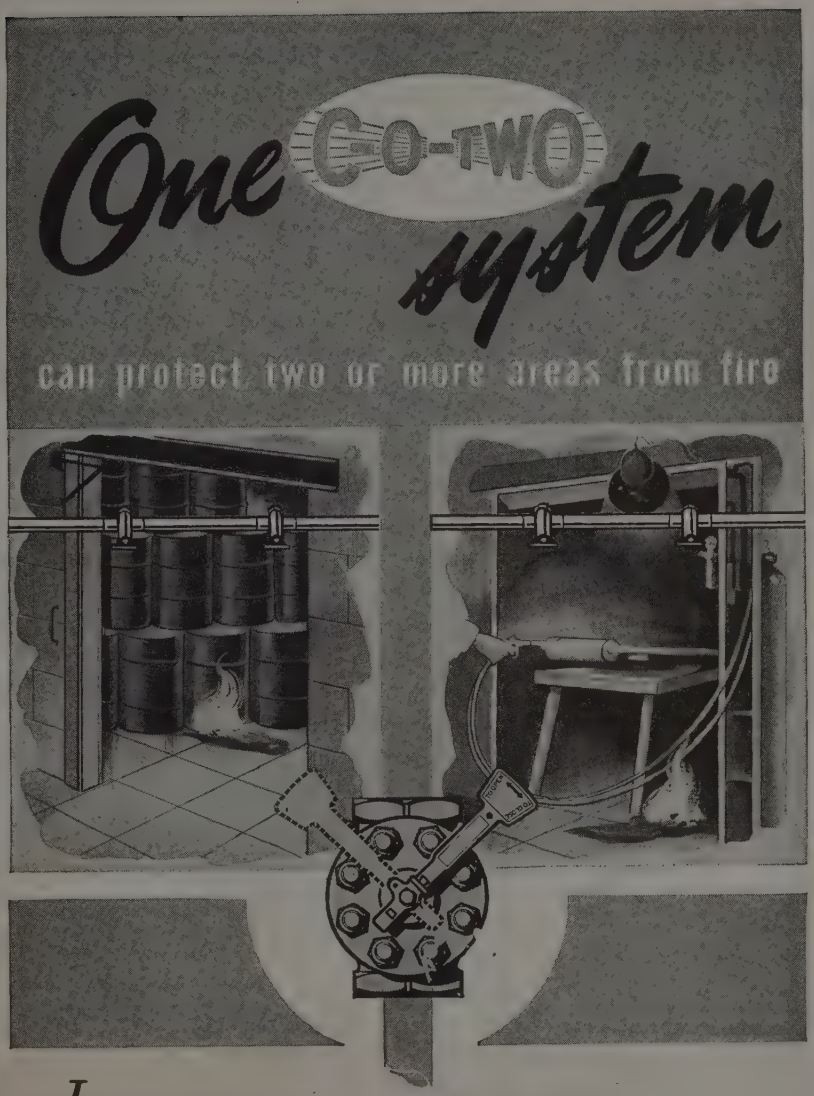
er bearing plates and accurate rela-
ship of all holes and bores.
t is highly significant that in the
sel engine machining techniques dis-
sed in this article, all dimensions are
d exactly to engineering specification
ardless of part size or shape of the
ts. Beyond all that, an almost un-
ited range of machining work can be
formed efficiently on the same hori-
tal boring, drilling and milling ma-
nes. This general purpose machine
l enables the diesel manufacturer to
duce better engines faster and at the
ne time to cope with design changes
hout a big retooling program. All
t is required is a reasonable degree
imagination and ingenuity and willing-
s to learn the full possibilities of the
chines and the various standard tools
l attachments which the machine tool
lders have developed to broaden their
d of usefulness on just such operations
have been dealt with in this article.

rritic Alloys Tend To esist Flue Gas Corrosion

Proper selection of ferritic type chro-
um-molybdenum steel alloys tends to
duce trouble caused by steam and flue
corrosion at metal temperatures up
about 1200°F. This fact was brought
by Paul M. Brister, staff engineer
d J. H. Romer, chief chemist, of Bab-
k & Wilcox Co., New York, in a paper
sented before the Louisville chapter
the Electro-Chemical Society.

Corrosion in the form of intergranular
integration of the metal adjacent to a
that is filled with iron oxide is serious,
t not prevalent in certain types of high
ssure boilers. The paper revealed that
posits of metallic copper and oxides of
pper are usually present in the corro-
n zone. The authors related that dis-
ved ammonia in the boiler feedwater
ght bring copper into the boiler, pro-
ling there are materials containing
pper in the system.

Elimination of this type of corrosion
uld have to come from elimination or
duction of ammonia in the feedwater
am system, maintaining the boiler
ter at a satisfactory alkalinity level,
ducing the dissolved oxygen in the
dwater and maintaining a small but
sitive excess of sulphite in boiler water.
De-slaggers are usually used to keep
perheater tubes free from ash or slag
cumulations, the paper stated. High
tal temperatures experienced with
perheaters are in the range where a
action between iron and steam will
cur, where air oxidation may be severe
d where strength of ferritic type alloy
el is relatively low. Creep characteris-
s of steel at high temperatures, make
necessary to consider stress in dis-
ssing corrosion.



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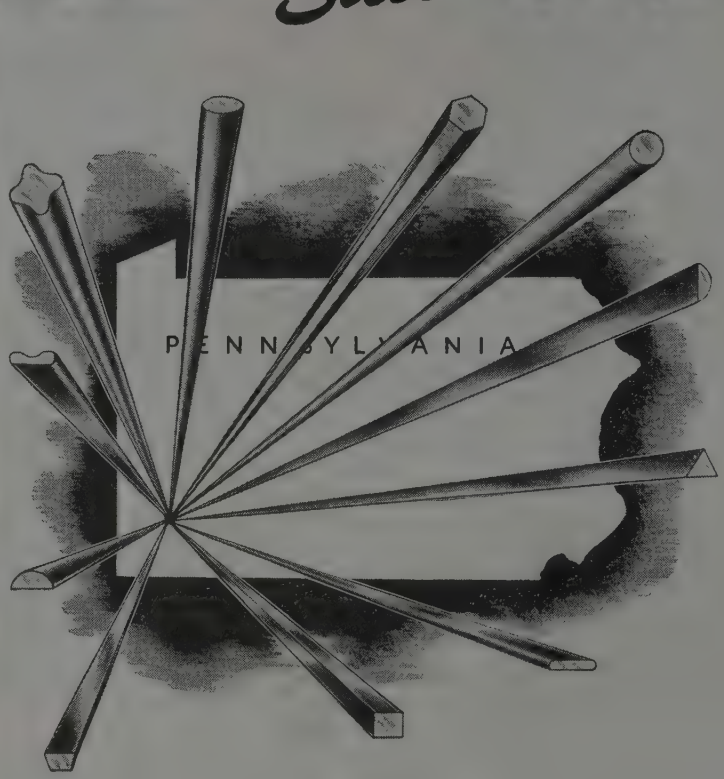
PAGE *Stainless Steel* WIRE



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Chemically-Generated Film

(*Concluded from Page* 102)

ing machine company uses the w system of refrigeration. The bottle co tainer it makes is of galvanized materi and the tank of stainless steel. Extrem galvanic corrosion conditions normall created betwen the galvanized and stai less steel surfaces, corrode away th galvanized basket. This condition ne is prevented by Iridite-treating of th basket. Thus far, after more than year's testing, no corrosion has resulte

Many auto manufacturers are usin the film to combat oxidation caused b moisture content found in carbureto and fuel pumps (zinc die castings Also many washing machine makers u the film on zinc die cast pump par and other similar operating mechanism that are exposed to the action of soap water.

One of the interesting process metho now under study in Allied Research laboratory is the application of the fil by brush or spray methods. This wo is not complete, but practical field tes and laboratory experiments look promi ing.

Statistical Control as Tool for Better Quality

Statistical Quality Control, by Euge L. Grant; cloth, 563 pages, 6 x 9 i published by McGraw-Hill Book Co. In New York, for $5.

This volume deals with laws of pro ability that many be used to impro acceptance procedures, and thus obta best possible quality assurance from given inspection cost. The Shewhart co trol chart is explained, with its u in manufacturing to reduce costs spoilage and rework, and to obtain better co-ordination between desig production and inspection.

Careful explanation of basic principl is accompanied by many practical e amples, demonstrating the broad usefu ness of quality techniques in dea ing with quality problems in mass produ tion.

The book is a working manual. object is to explain simple but power statistical techniques that can be wide used in industry to reduce costs a improve quality. No attempt was made write for the professional statistician mathematician. The aim is to give ju enough theory to supply practical wo ing rules that will enable one to reco nize limitations as well as the ma uses of the methods.

Statistical quality control should viewed as a useful tool for solution many manufacturing problems that ca not be solved so well by any oth known method, the author concludes.

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CHAPTER VI — Rolling Mill Torque.

APPENDIX (The Rolling of Non-ferrous Metals—Roll Passes for Seamless Tubes.)

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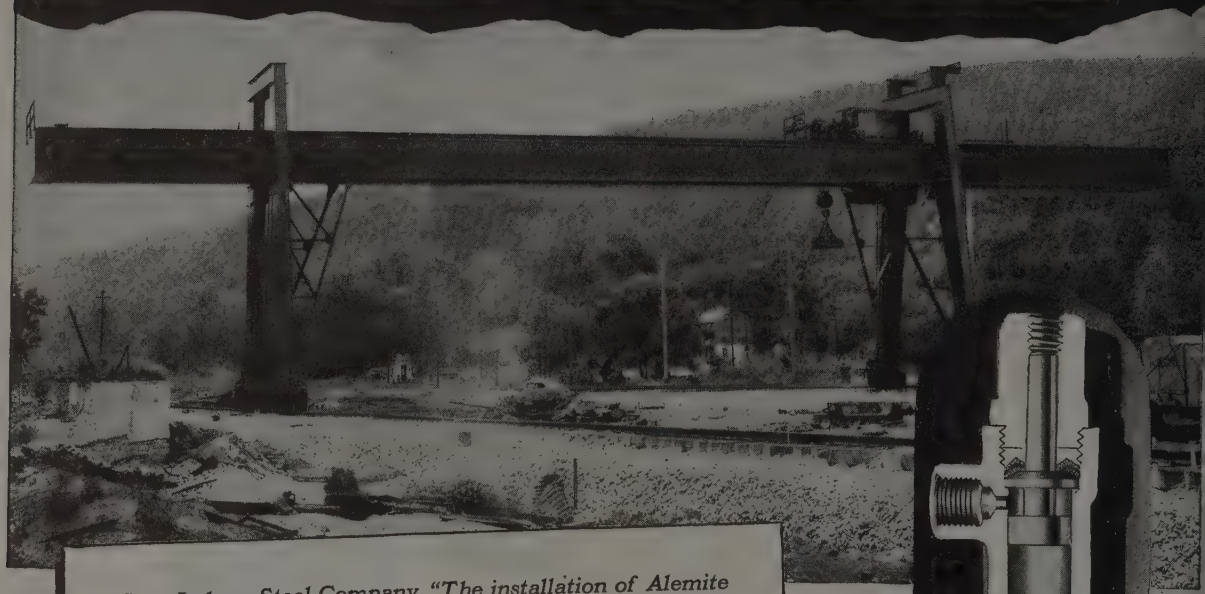

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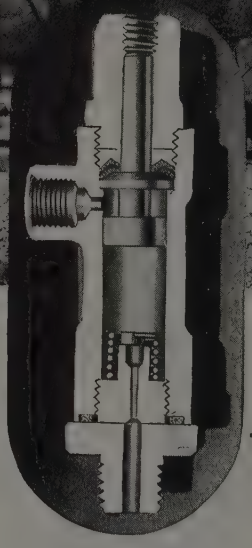

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1. EQUIPMENT 2. PROCEDURES 3. LUBRICANTS

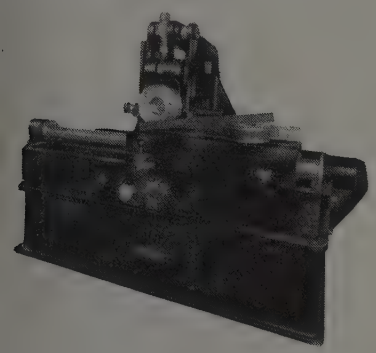
New Products and Equipment

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 150

1. Scale Marking Machine

Numbers or graduations may be rolled into metal bars and plates such as scale beams, machinery scales, etc., using the model 325 hydraulic marking machine announced by Geo. T. Schmidt Inc., 4110 Ravenswood avenue, Chicago 13. It may also be used for rolling lettering on can bands or barrel hoops up to 30 in. long.

The table itself, upon which the work rests during marking, is bored for hy-



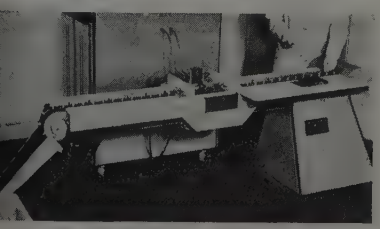
draulic cylinders. It is geared to the knurl, providing the positive feed necessary to eliminate crawl between work and knurl. Lever at front center trips valve to start table for travel stroke which is adjustable from 6 to 30 in. Table automatically stops at end of stroke, permitting marking in both directions.

2. Fire Extinguisher Bracket

Only two screws are required for mounting the fire extinguisher bracket announced by Walter Kidde & Co. Inc., Belleville, N. J., for their 2½-lb carbon dioxide portable extinguisher. Two spring type clips hold the extinguisher firmly in place.

3. Conveyor Belt Table

Conveyor belt table for use with any induction heater is announced by Lepel High Frequency Laboratories Inc., New



York. It efficiently handles work parts for brazing, soldering, annealing, hardening, etc. Belt is powered by a ¼-hp motor, its speed regulated over a wide range to accommodate a variety of applications.

The belt proper permits fastening of interchangeable supports to hold various shaped work parts in place. The load coil, shown in the center of the table, is moveable and may be placed to fit the application.

4. Spray Booth

Stainless steel spray booth for silver spraying objects in preparation for electroplating is announced by Monomelt

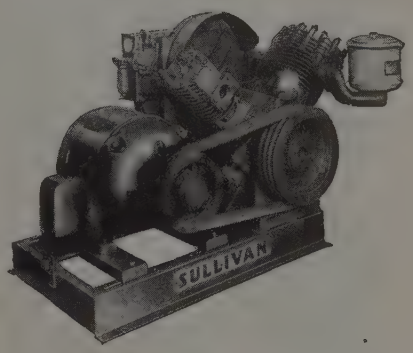
Co. Inc., 1611 North East Polk street, Minneapolis. It is equipped with foot-operated water spray, air reducer, plate glass baffle to protect operator, air pressure indicator, safety valve and rotating jig for holding objects to be sprayed.

A suction fan draws excess spray out of the booth through a duct behind the jig. Nonglare illumination is provided by a fluorescent light built in the ceiling. Booth is impervious to corrosive chemicals. It is smooth and easy to clean.

5. Air Compressors

Because of their compact construction and vibration-free operation, the 2-stage, air-cooled stationary air compressors announced by Sullivan Division, Joy Mfg. Co., Pittsburgh 22, require only a small foundation. These Unitair compressors are offered in nine sizes with power requirements ranging from 15 to 100 hp, and piston displacements from 81 to 590 cfm at 100 psi discharge pressure.

All units are completely air cooled. The three standard electric drives include built-in motor, direct connected motor and V-belt drive. They also may



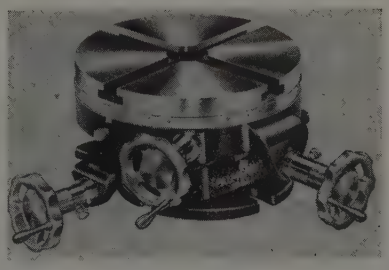
be equipped for use with gasoline or diesel engines.

6. Carbide Tipped Boring Tools

Standardized carbide tipped boring tools in seven basic styles of four to six sizes each are announced by Carboloy Co. Inc., Detroit. All styles are carried in stock in grades for both steel cutting and boring of cast iron and other materials. All types and sizes are finish ground with a nose radius.

7. Indexing Table

Full 360-degree rotary movement and 4-in. cross feed travel are incorporated in the Palmgren No. 83 indexing table announced by Chicago Tool & Engineer-



ing Co., 8383 South Chicago avenue, Chicago 17. Table is 8 in. diameter and includes a ⅝ x 1⅛-in. T slot. It is graduated for the full 360 degrees by single degrees in right angle segments.

Cross feed movement, 2 in. each way

from center, is controlled by a graduated screw which permits infinite adjustment. Base has four bolt and key slots for rigid mounting of table to a milling machine, drill press, shaper or surface grinder.

8. Laboratory Oven

Equalization of oven heat by means of a simple double venting device is a feature of the model KH 1200 electric laboratory oven developed by K. H. Huppert Co., Chicago. The automatic hydraulic-electric temperature control is

very sensitive, temperature being controlled to an accuracy of plus or minus 1° C within the furnace range to 420° F or 220° C.

Oven is insulated with 1⅝-in. thermoblock for maximum heat retention. It has a stainless steel interior. Inside dimensions are 10 x 10 x 12 in. Two adjustable vents having stainless steel slides to control exhausted air and equalize temperature inside oven are supplied.

9. Anchoring Metal

Bismuth, lead, tin and antimony are alloyed to make Moldaloy, a product of Trethaway Associates, 37 Wall street, New York, used for quick and accurate anchoring of drill jig bushings. With a melting point of 430°, heat generated during machining will not soften the alloy, permitting bushings to shift. Shrinking after solidifying is only 0.001-in.

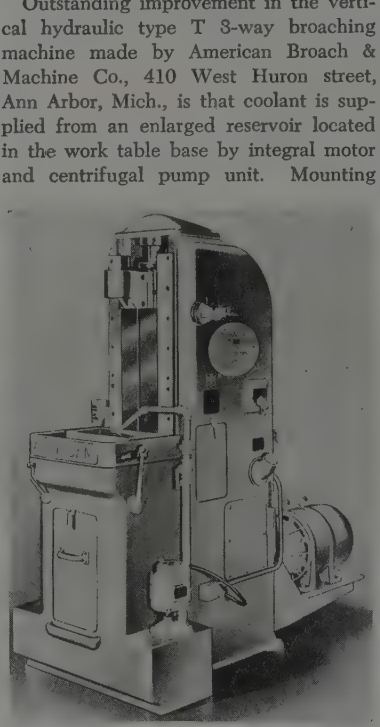
10. Capacitor Motor Relay

Designed for use with single phase alternating capacitor motors for oil burners, refrigeration units and other applications, the new Bulletin 109 relay built by Ward Leonard Electric Co., Mt. Vernon, N. Y., may be externally or remotely mounted. Essentially it is a potential device operating over a wide range of voltages.

Chatterless relay operation to the drop-out point is obtained through its magnetic circuit design. Contacts are single-pole normally closed, suitable for operating a load as large as a 1-hp, 115 or 230 v 60 cycle capacitor motor. Relays measure 1¾ x 1 15/16-in.

11. Broaching Machine

Outstanding improvement in the vertical hydraulic type T 3-way broaching machine made by American Broach & Machine Co., 410 West Huron street, Ann Arbor, Mich., is that coolant is supplied from an enlarged reservoir located in the work table base by integral motor and centrifugal pump unit. Mounting



is such that pumping unit may be taken out by removal of four screws and disconnecting pipes.

Machine is manufactured in 4, 6 and 8-ton sizes with a 24 in. stroke, and 6, 10 and 15 tons with a 36 in. stroke. Adaptable to push, pull and surface broaching, it also may be used for arbor, straightening and assembly work.

12. Inside Micrometer

Found to be a time saver in machining back of a flange or boring recesses that have to be kept to close limits, a new type of inside micrometer, the Rimat, is announced by Richards Machine Tool Co., 124 South Isabel street, Glendale 5, Calif. In such cases, the direct reading instrument is inserted, the measurement taken, measuring pins retracted and the tool withdrawn.

Ends of the measuring pins are hardened and ground on a radius to prevent cramping. Graduations are clear cut. Micrometers have a 1 in. range and are available in two sizes: 3 to 4 in. with extra measuring rods up to 6 in., and 6 in. size with rods for measuring up to 12 in.

13. Temperature Controller

Combining features of Wheelco Instrument Co.'s electronic principle Capacitrol and the Xactline control unit, Claud S. Gordon Co., 3000 South Wallace street, Chicago 16, maker of the latter, is announcing a temperature-variation control instrument, the Xactline Capacitrol.

Features of the Xactline include: An "anticipating" factor which holds temperature tolerances as close as 1/5 of 1°F.; on-off cycles as short as 3 sec; positive electrical action; simple adjustment for wide range control requirements; and low operation cost.

Capacitrol features are instantaneous

control action, direct reading indicating scale, separately enclosed measuring instrument and interchangeable unit construction. Unit is offered in two models for varying requirements. It may be either flush or surface mounted.

14. Induction Heater

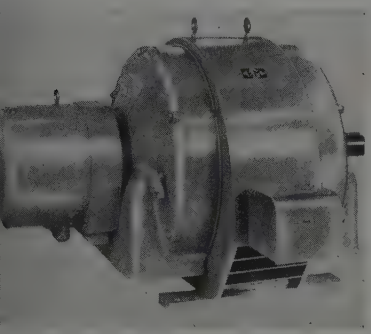
A portable induction heater manufactured in units of 10 kva for preheating and normalizing for welding is announced by Electric Arc Inc., 34 Jelliff avenue, Newark 8. Units may be stacked in groups of two or three units the latter capable of preheating a 10 in. pipe joint to 1300°F in 2 hours.

Each unit is complete in itself, containing power unit, contactor, meters and control supply. Heating current and voltage output variations are made by a selector switch built into the unit. Controlling pyrometers and program

ntrollers may be plugged into the eater in two polarized receptacles for ecording job temperatures and heat rcles. Known as model UP, unit may so be used for thawing large water nes, testing high current power bus nnections and supplying phantom loads r testing relays on power systems.

5. Synchronous Motors

Heavy duty synchronous motors for nstant speed drives up to 100 hp are fered in splash proof construction de- ed by chemical plants, mining and illing operations and for pumping jobs



Electric Machinery Mfg. Co., Minne- olis 13.

Brush inspection and blowing out is mplified with access plates designed r rapid removal and replacement. aled bearings may be cleaned and re- led without motor disassembly. Blower each end of rotor provides double end ntilation. Motors are available in unity leading power factor with torque and a requirements to suit the job.

6. Direct Current

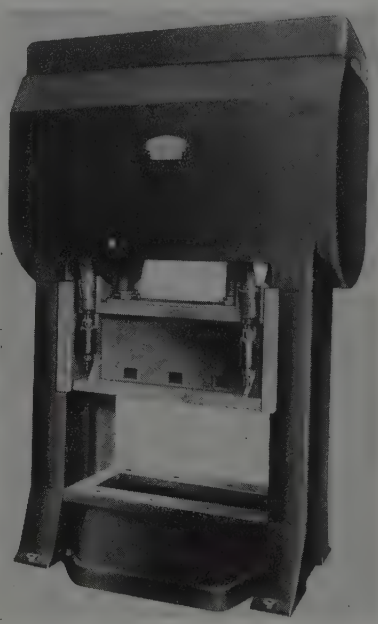
A direct-current amplifier for use with e magnetic direct inking oscillograph ade by Brush Development Co., Cleve-

nd, is announced by that company. esignated as model BL-913, it has a equency response on direct current to 0 cps, and a voltage gain of approxi- ately 1000 times.

Input impedance of the unit is 10 egohms and input voltage range is 0.001 to 200 v. Balancing is to position pen electrically to any position on the chart. The 33 lb unit measures 7½ x 11 x 17¼-in. and is shown at left in photo. Unit at right is the oscillograph.

17. Toggle Press

Two-point double-action toggle press, manufactured by Cleveland Punch & Shear Works Co., Cleveland 14, is of



streamline design with all gears and drive unit located in the box type crown. It has two slides—an inner slide and an outer—or blankholder slide. Inner slide has a stroke of 28 in., with a 6 in. adjustment and 500 tons capacity. The outer slide has a stroke of 26 in., 6 in. adjustment and 300 tons capacity. Operation is at the rate of six strokes per minute.

18. Oscilloscope

Capable of measuring alternating and direct current, a 3-in. oscilloscope for electronic testing, measuring and research is offered by Waterman Products Co. Inc., Philadelphia. Termed the Pocketscope, it is completely insulated from input circuits for industrial safety.

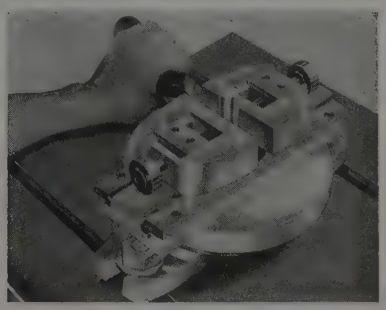
Additional features include push-pull amplifiers for horizontal and vertical deflection, linear time sweep from 3 cycles to 50 kc, intensity modulation amplifier, antistigmatic centering controls and attenuators for alternating as well as direct current.

FOR MORE INFORMATION

on products and equipment described in this section, fill in a card following page 150.

19. Cam Actuated Vise

Self-centering, double cam actuated vise which centers the work to the drill or cutter regardless of the dimensional variation of the piece, is introduced by Williams Products Co., Middletown, Conn. One hand operating and lock-



ing feature of the vise permits faster use and greater efficiency.

Frame and carriage are machined from iron castings while cam plate is machined from heat treated alloy steel. Machining is held to close tolerances. Jaw blanks ground for squareness allows vise to perform accurate secondary operations at high speed with minimum maintenance. A 3-in. opening in the center allows work and chips to fall clear when cam lock is released. Specially formed jaws for irregularly shaped parts are available.

20. Photoelectric Actuator

With a beam approximately 1/16-in. wide that will respond to light level changes as small as 20 per cent, the model 600 photoelectric actuator developed by Potter Instrument Co., 136-56

Roosevelt avenue, Flushing, N. Y., makes possible counting of objects of small size, irregular shape or light weight at high speeds.

Since complete interruption of the light beam is not required for normal operation, objects as small as 0.0001-in. may be counted with accuracy. This

permits detection of objects without complete separation.

Actuator provides negative pulses required for operating Potter electronic counters. It is designed to detect objects at rates up to 30,000 per minute. Unit also contains a capacitor discharge output circuit for high speed operation of control solenoids such as those required for deflector gates and packaging equipment.

21. Permeability Meter

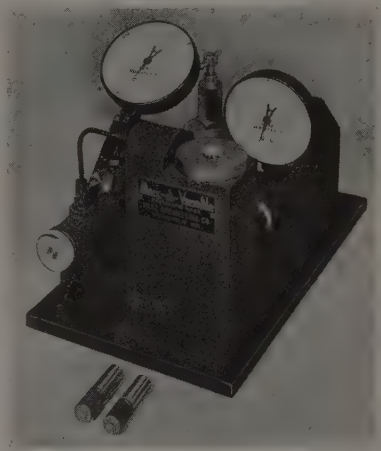
Elimination of human error in determining the permeability or air flow of foundry molding materials, soils and other materials is possible with Permmeter manufactured by Harry W. Dietert Co., Detroit 4. It is a direct reading permeability meter which measures the air flow through specimens of any material.

An automatically operated electric timer unit, driving a circular dial reading in cubic centimeter air flow per minute at 1g pressure, is employed with a gasometer unit. Movement of the gasometer bell automatically starts and stops the timer unit when a given quantity of air or chosen gas is passed through the test specimen. All timing and calculations are performed by the instrument.

22. Pneumatic Gages

Development and production of a line of pneumatic and taper gages known as New-Matic with a "reversed-flow" air control is announced by Merz Engineering Co., 200 South Harding street, Indianapolis 7. The flow feature provides both a calibrated measurement scale of the required magnification and a "zero" adjustment for returning the calibration to a basic value.

Gages are equipped with continuously variable and adjustable orifices, making possible control of air volume, as well as pressure and providing "balanced" air for high precision measurement. Five



gage models are made to fit inspection requirements of every type. A variety of standard and specially-built accessories are available for use with the gages.

23. Stainless Steel Electrodes

Furnished with a heavy extruded lime type coating for direct current application, stainless steel electrodes in a full range of grades and diameters are offered by Wilson Welders & Metals Co. Inc., 60 East 42nd street, New York 17. In addition, all but the straight chromium analyses are obtainable with a lime-titania type coating which is usable on alternating or direct current.

24. Small Parts Marker

Parts as small as 3/16-in. long and ⅛-in. diameter may be marked a dozen at a time by the No. 920-S marking machine announced by Acromark Co., 398 Morrell street, Elizabeth, N. J. Commonly used for small studs, the machine holds them in a holder in the manner of rivets in a riveting machine. A half swing of the operating lever moves the studs past the engraved marking die, after which they fall out of the machine.

25. Industrial Wheels

Light weight industrial wheels, ranging in size from 6 to 12 in. and in load rating from 480 to 1200 lb are offered by Thermoid Co., Trenton, N. J. They are of tough aluminum alloy castings with oversize ball bearings and built-in grease seals.

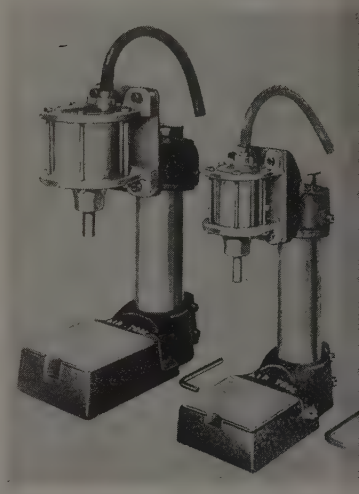
A large grease reservoir, equipped with a standard grease gun fitting is provided. The rubber tread is smooth, cut resistant and quiet in operation. Sizes available are 6, 8, 9, 10 and 12 in. H lengths and axle sizes vary.

26. All-Position Electrode

Developed for all-position welding low alloy cast steel or low alloy hi tensile strength rolled steels, the AC MO electrode, developed by Westin house Electric Corp., Pittsburgh 30, offered in four diameters from 3/32 3/16-in. Designed primarily for t with alternating current, it will perfor satisfactorily with direct current, rever polarity.

27. Air Arbor Press

Air arbor presses which combine fe tures of both arbor and kick type equi ment are offered by Air-Trol, 2653 We Lake street, Chicago 12. Heavy du



model provides a ¾-ton squeeze at 15 lb line pressure. The smaller mo delivers approximately ¼-ton at 150 line pressure.

Units, when applied to arbor or k type press operations, may be set regulating air line pressure to give u form pressure on each application. B models, where operated with foot va control, deliver a full stroke with l than 1 in. of foot movement. Cylin brackets are fully adjustable on the c umns to give a working range or r clearance, of 0 to 6 in. over the table

FOR MORE INFORMATION
on the new products and equipmen in this section, fill in this card It will receive prompt attention

Helpful Literature

43. Hydraulic Power Pumps

Worthington Pump & Machinery Corp.—8-page illustrated bulletin No. W-414-B50 presents data on automatic Variflo triplex power pumps with 0 to 100-per cent capacity for boiler feed, oil field water flooding, pipe line pumping, desuperheater feed, hydraulic extrusion press and process charging service.

44. Plastic Film Protection

Better Finishes & Coatings, Inc.—10-page illustrated bulletin "Liquid Envelope in the Metal-Working Industries" serves as progress report in describing peelable plastic protective coating as applied to work in metal working industries. Wide range of applications is shown and described.

45. Roof Ventilators

Burt Mfg. Co. — 62-page illustrated catalog "Burt Roof Ventilators" presents design and construction features of Monovent, free flow and standard gravity ventilator equipment. Tables of capacities and other application data are included.

46. Industrial Truck Guards

Towmotor Corp.—2-page illustrated bulletin describes overhead guards for Towmotor industrial lift trucks. Construction, method of attachment and tables of dimensions and weights are included.

47. Small Quenching Unit

Bell & Gossett Co.—4-page illustrated catalog No. JC-1144 describes Junior Quencher for controlled quenching where small pieces are heat treated. Unit is suitable for use in tool and die shops, laboratories and small piece custom heat treating operations. Specifications and methods of use are outlined.

48. Furnace Lining

Cleveland Quarries Co.—22-page illustrated bulletin No. 15-B outlines uses of Buckeye Silica Firestone in soaking pits, Bessemer converters, blast furnace ladles, mixers, gray iron cupolas, foundry crane ladles, malleable furnaces, drop forge furnaces and in other refractory application.

49. Bushings & Bearings

National Formetal Co.—16-page illustrated catalog "Formetal Superformed Bushings and Bearings" describes wide range of sizes of these parts and also gives data on spacer tubes, sleeves, ferrules and tubes in short lengths which can be furnished in any metal or alloy or to specification. Tabular matter includes typical applications, material specifications, tolerances, groove patterns and sizes.

50. Stainless Steel Sheets

Eastern Stainless Steel Corp.—96-page illustrated hard-bound book shows numerous typical and unusual applications of stainless steel sheet in many industries and includes extensive factual and technical data on characteristics, specifications and properties of stainless steels.

51. Industrial Vaporizer

John E. Mitchell Co.—4-page illustrated filable bulletin presents data on Mitchell industrial liquid petroleum gas vaporizer for use with either above ground or below ground tanks. Automatic selective control regulates supply of gas to meet demand. Specifications, dimensions and installation information are included.

52. Electronic Timers

General Electric Co. — 4-page illustrated bulletin No. GEA-2902C describes type CR7504 electronic timers for accurate, adjustable timing control of processing, cycling, sequencing, limiting and delaying operations. General description and schematic wiring diagram of control are included.

53. Die Casting

Doehler-Jarvis Corp.—30-page illustrated catalog "Successful Die Casting" presents details of manufacturing facilities and geographical location of plants to serve industrial organizations.

54. Fixture Clamps

West Point Mfg. Co.—4-page illustrated bulletin No. 21 describes five types of fixture clamps for incorporation in tool designer's fixture layouts. Tables list dimensions of six sizes of each of five types. Accessories are included.

55. Push-Pull Control

Automotive & Aircraft Div., American Chain & Cable Co.—16-page illustrated catalog "Tru Lay Push-Pull" describes method by which push-pull motion is transmitted through flexible metal conduit for all types of controls. Application data are included.

56. Ladles

Whiting Corp.—44-page illustrated bulletin No. FY-144 presents 50 photos, 28 drawings and 30 specification tables on Pour-Rite ladles which feature air-cooled trunnions. Discussion of ladle handlers and monorail pouring systems is included.

57. Steel Industry

Standard Oil Co. of New Jersey—8-page illustrated brochure is entitled "Making America . . . with Steel." This article outlines history of steel industry in the United States and traces its development to present time.

58. Reproduction Process

Eastman Kodak Co.—4-page illustrated booklet entitled "Kodak Transfax. A revolutionary New Reproduction Process" describes method of reproducing drawings and other line work on metals, plastics and plywood or pressed woods. Process, manipulation and uses in fields of research and production are discussed.

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59. Oil Hardening Steel

Kloster Steel Corp.—4-page illustrated bulletin on Swed-Oil nonshrinking steel covers features, machining, uses, heat treatment procedure and properties of this oil hardening steel which is available from stock in over 400 sizes of rounds, flats and squares.

60. Slitting Shear

Beverly Shear Mfg. Co.—1-page illustrated leaflet describes model S-3 slitting shear with slitting capacity up to ⅛-inch mild steel, trimming capacity to 3/16-inch mild steel, bar capacity, up to ¼ x 2 inches in mild steel and stainless steel capacity to No. 10 gage. Specifications and prices are given.

61. Turbine Maintenance

Westinghouse Electric Corp.—Pocket-size handbook No. B-3747 contains practical information regarding maintenance of general purpose turbines. Installation, directions for piping and procedure for necessary repairs and adjustments are discussed. Emergency hints for quick reference if turbine is operating improperly are also included.

62. Motorized Hand Truck

Lift Trucks, Inc.—6-page illustrated bulletin gives details of motorized HydroLectric lift truck. This power driven hydraulic lift truck has capacity of 4000 pounds. All controls are located conveniently in handle which is balanced for ease in manipulation and steering.

63. Die Casting Machine

Light Metal Machinery, Inc.—8-page illustrated folder is descriptive of fully automatic high speed, low cost die casting machine for zinc, lead and tin. Patented cycling mechanism provides automatic die movement, shot and injection in continuously repetitive cycles. Operating speeds of up to 720 shots per hour are obtainable.

64. Stencil Marking

Marsh Stencil Machine Co.—40-page illustrated catalog No. C-47 presents data on stencils, fountain brushes, stencil cutting machines, inks, felt tip markers and oil stencil boards. Stencil brushes, ball marking pot, box scraper, stencil figure wheels and adjustable brass stencils are described briefly.

65. Materials Handling

Automatic Transportation Co.—8-page illustrated folder describes 25-minute, 16-millimeter, talking motion picture entitled "Pay Loads Pay Off" which covers mechanical load handling and stacking. Scenes from film show both manual and mechanized ways in which materials are handled.

66. Hydraulic Control Systems

Hydraulic Equipment Co.—4-page illustrated bulletin describes complete hydraulic control systems. Included are details of valves, pumps, multiple pumps, cylinders and complete power units. Typical installations are covered.

67. Valve Reference Chart

Ohio Injector Co.—20-page valve cross reference chart contains complete listing of OIC valve numbers and corresponding competitive valves in order with their descriptions. Complete line of steel, iron and bronze valves is covered.

68. Electric Power Equipment

Allis-Chalmers Mfg. Co.—12-page illustrated bulletin No. 25B6183 describes Texrope V-belt drives, centrifugal pumps, alternating and direct current motors, motor controls, dry-type transformers and alternating and direct current welders for fabrication of and use on heating, ventilating and air conditioning units.

69. Blast Cleaning Machine

American Wheelabrator & Equipment Co.—20-page illustrated catalog No. 214-A presents construction features, overall dimension drawings and specifications of Wheelabrator Swing Table airless abrasive blast cleaning machines which are available in five sizes. Operating performance, ventilation requirements, installation and design variations available for handling special applications are covered.

70. Conveyorized Work Table

Island Equipment Corp.—8-page illustrated bulletin describes Unitables which are all-purpose conveyor-work tables for assembly, inspection and packaging operations. Specifications and applications for standard and special types are covered.

71. Flexible Pouring Buckets

B. F. Goodrich Co.—4-page illustrated catalog section No. 9425 covers lines of Flexible rubber pouring buckets, funnels and dippers for handling of acids, corrosives, liquid explosives and other highly active liquids.

72. Hydraulic Presses

Rogers Hydraulic Inc.—12-page illustrated bulletin No. 216 describes line of universal hydraulic presses for pulling, pressing and jacking operations. Details of stationary shop presses are presented also.

73. Metal Turnings Crusher

American Pulverizer Co.—8-page illustrated bulletin describes American Ring metal turnings crushers. Cutaway illustrations, dimensional data, general specifications and typical installations are shown. Advantages of handling crushed turnings are outlined.

74. Machine Tools

Rockford Machine Tool Co.—32-page illustrated brochure describes line of Hy-Draulic shapers, planers, slotters and shaper-planers. Dimensional data, operating features and advantages of design are discussed. Typical installations are shown.

75. Machine Tools

Crozier Machine Tool Co.—12-page illustrated catalog describes features and operation of Time-Saving tools and various models of Vacuum-Grip speed lathes for odd shaped parts. Tool post turrets equipped with cutting-off tool and holder and collet attachments are covered

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Scrap Regaining Strength Despite Restricted Buying

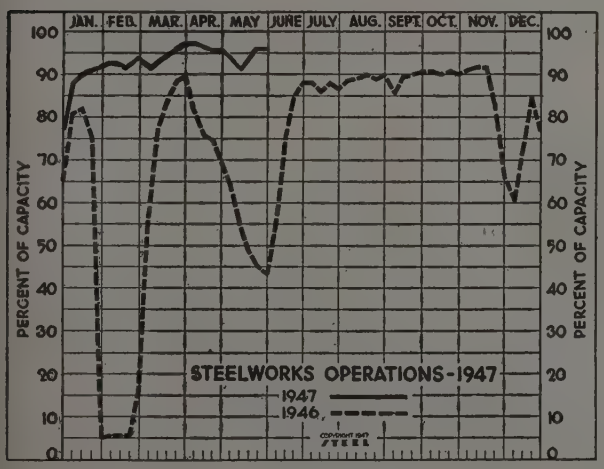
Completion of high-priced tonnage shipments and continued booming steel operations spur hopes for demand revival. Finished steel requirements top supply in many directions.

RENEWED strength is developing in the iron and steel scrap market reflecting completion of many high-priced tonnage shipments and trade expectations of a strong revival in demand with steelmaking operations holding at near-capacity. At Pittsburgh and in the East prices show definite signs of turning higher.

The stronger tone is in the face of continued slow buying with most mills out of the market and exercising greater selectivity in accepting tonnage. Supplies are reported improving with the mills taking in considerable tonnage from customers. Dealers' stocks are low, however, and with steel mill and foundry requirements expected to continue heavy for months to come, the feeling persists a renewal of consumer buying cannot long be deferred.

Demand for finished steel products continues strong despite sustained production and signs of increasing caution in ordering. Requirements for sheets, strip, pipe, plates and carbon bars continue well in excess of supply. While there may be some easing before summer ends, indications are demand will still top supply in products now on the scarce list. Even structural shapes are expected to continue tight despite the lag in building. In the light, flat-rolled carbon items, including light gage plates, some trade observers look for no material easing in conditions this year. Supply pinch is most severe in sheets and strip but plates are also very active, with tank fabricators busy, railroad equipment needs expanding, and manufacturers of large line pipe pressing for tonnage.

Consumers are ordering more conservatively, including sheets, but nevertheless they still want more tonnage than they can get. Some of this conservatism is due to unbalance in product inventories which is hampering some manufacturing operations. In sheets buyers appear less frantic for tonnage, reflecting some modification of manufacturing programs.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended May 31	Change	Same Week 1946	Same Week 1945
Pittsburgh	103	None	27	90.5
Chicago	95.5	+ 1	57.5	97
Eastern Pa.	89	— 2.5	34	92
Youngstown	93	None	13	80
Wheeling	81.5	—12	53	89.5
Cleveland	93.5	+ 2.5	61	91
Buffalo	88.5	+ 2.5	63	90.5
Birmingham	99	None	44	90
New England	95	None	60	90
Cincinnati	87	— 4	82	84
St. Louis	68.5	None	49.5	75
Detroit	90	— 3	79	83
Estimated national rate	95.5	— 1	43	91.5

Based on weekly steelmaking capacity of 1,749,928 net tons for 1947; 1,762,381 tons for 1946; 1,831,636 tons for 1945.

"Gray" market operations in steel products appear tapering off. Offerings now are reported at prices considerably under recent high levels. Extent of trading in this market is uncertain. Testimony at the Senate Small Business Subcommittee hearing indicates the large aggregate tonnage offered in this market is of the "daisy chain" variety with the same tonnages changing hands several times. Little evidence of illegal operations has been uncovered.

In the regular steel market prices continue firm, talk of possible reductions having faded to a whisper. Last week one maker of bolts announced a new schedule of discounts, incorporating slight increases and decreases. Other producers are understood refiguring lists. Important advances were effected last week on copper and copper-base alloy products.

Memorial Day observance cut steelmaking operations slightly, most mills maintaining normal furnace schedules. Some finishing mills, however, were closed. Estimated national ingot rate for the week declined 1 point to 95.5 per cent, which rate, if continued over the remainder of the year, would result in record-breaking peacetime output. Last week operations fell 12 points to 81.5 per cent in Wheeling and 7 points to 87 per cent in Cincinnati, while easing 3 points to 90 per cent in Detroit and 2½ points to 89 per cent in eastern Pennsylvania. The operating rate rose 2½ points to 93.5 per cent in Cleveland, 2½ points to 88.5 per cent in Buffalo, and 1 point to 95.5 per cent in Chicago. Elsewhere operations held unchanged.

STEEL's composite price average on steelmaking scrap rose 50 cents to $29.92 last week, while the finished steel composite held steady at $69.82, that on semifinished steel at $52.10 and that on steelmaking pig iron at $32.49.

COMPOSITE MARKET AVERAGES

	May 31	May 24	May 17	One Month Ago May, 1947	Three Months Ago Mar., 1947	One Year Ago June, 1946	Five Years Ago June, 1942
Finished Steel	$69.82	$69.82	$69.82	$69.82	$69.82	$64.09	$56.73
Semifinished Steel	52.10	52.10	52.10	52.10	52.10	40.60	36.00
Steelmaking Pig Iron	32.49	32.49	32.49	32.49	32.40	27.50	23.00
Steelmaking Scrap	29.92	29.42	29.42	29.75	37.25	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Material

	May 31, 1947	May, 1947	Mar., 1947	June, 1946
Steel bars, Pittsburgh	2.60c	2.60c	2.60c	2.50c
Steel bars, Philadelphia	2.98	2.98	2.98	2.82
Steel bars, Chicago	2.60	2.60	2.60	2.50
Shapes, Pittsburgh	2.50	2.50	2.50	2.35
Shapes, Philadelphia	2.64	2.64	2.64	2.465
Shapes, Chicago	2.50	2.50	2.50	2.35
Plates, Pittsburgh	2.65	2.65	2.65	2.50
Plates, Philadelphia	2.85	2.85	2.85	2.55
Plates, Chicago	2.65	2.65	2.65	2.50
Sheets, hot-rolled, Pittsburgh	2.50	2.50	2.50	2.425
Sheets, cold-rolled, Pittsburgh	3.20	3.20	3.20	3.275
Sheets, No. 10 galv., Pittsburgh	3.55	3.55	3.55	†4.05
Sheets, hot-rolled, Gary	2.50	2.50	2.50	2.425
Sheets, cold-rolled, Gary	3.20	3.20	3.20	3.275
Sheets, No. 10 galv., Gary	3.55	3.55	3.55	†4.05
Hot-rolled strip, Pittsburgh	2.50	2.50	2.50	2.35
Cold-rolled strip, Pittsburgh	3.20	3.20	3.20	3.05
Bright basic, bess. wire, Pittsburgh	3.425	3.425	3.425	3.05
Wire nails, Pittsburgh	4.125	4.125	4.125	3.50
Tin plate, per base box, Pittsburgh	$5.75	$5.75	$5.75	*$5.25

* Nominal. † Base, No. 24 gage.

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$50.00	$50.00	$50.00	$38.00
Slabs, Pittsburgh, Chicago	42.00	42.00	42.00	39.00
Rerolling billets, Pittsburgh	42.00	42.00	42.00	39.00
Wire rods 7/32 to 1/4-inch, Pitts.	2.55c	2.55c	2.55c	‡2.30c

‡ Base, No. 5 to 5/8-in.

Pig Iron

	May 31, 1947	May, 1947	Mar., 1947	June, 1946
Bessemer, del. Pittsburgh	$34.83	$34.83	$34.83	$29.69
Basic, Valley	33.00	33.00	33.00	28.00
Basic, eastern del. Philadelphia	35.52	35.52	34.26	27.84
No. 2 fdry., del. Pgh. N. & S. sides	34.33	34.33	34.33	29.19
No. 2 fdry., del. Philadelphia	36.02	36.02	34.76	28.34
No. 2 foundry, Chicago	33.00	33.00	33.00	28.50
Southern No. 2 Birmingham	29.88	29.88	29.28	22.88
Southern No. 2, del. Cincinnati	34.75	34.75	34.15	26.94
Malleable, Valley	33.50	33.50	33.50	28.50
Malleable, Chicago	33.50	33.50	33.50	28.50
Charcoal, low phos., fob Lyles, Tenn.	40.50	40.50	40.50	33.00
Gray forge, del. McKees Rocks, Pa.	33.66	33.66	33.66	28.55
Ferromanganese, fob cars, Pittsburgh	140.25	140.25	140.25	140.00

Scrap

Heavy melting steel, No. 1, Pittsburgh	$30.00	$30.00	$37.25	$20.00
Heavy melt. Steel, No. 2, E. Pa.	29.00	28.10	38.50	18.75
Heavy melt. steel, Chicago	28.75	29.25	35.125	18.75
Rails for rerolling, Chicago	34.00	34.50	40.75	22.25
No. 1 cast, Chicago	35.50	36.90	43.25	20.00

Coke

Connellsville, furnace ovens	$9.125	$9.125	$8.875	$8.75
Connellsville, foundry ovens	10.375	10.375	10.375	9.50
Chicago, by-product fdry., del.	16.10	16.10	16.10	13.75

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, price negotiated, fob mill. Forging quality, $40, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown. **Alloy Steel Ingots:** Pittsburgh, Canton, $52.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $42; Portsmouth Steel Corp., $55-$60, Portsmouth, O. Detroit, del., $45; eastern Mich., $46.

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $50; Detroit, del., $53; eastern Mich., $54.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $61; del. Detroit $64; eastern Mich., $65.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $50; Portsmouth Steel Corp., $66, Portsmouth, O.

Skelp: Pittsburgh, Sparrows Point, Youngstown, Coatesville, 2.35c per lb.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, 7/32 to 1/4-in., inclusive $2.55-$2.80 per 100 lb. Galveston base, $2.65. Worcester, add $0.10. San Francisco (base, del.), $3.27.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, Duluth, base, 20 tons one size, 2.60c; Detroit, del., 2.75c; eastern Mich., 2.80c; New York, del., 3.01c; Phila., del., 2.98c; San Francisco (base, del.), 3.33-3.65c; Los Angeles (base, del.), 3.325-3.56c; Seattle, 3.285c, base.

Rail Steel Bars: Price, 2.60c-2.95c, same basing points as merchant carbon bars, except base is 10 tons.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.05c; Detroit, del., 3.20c; eastern Mich., 3.25c (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.20c; Detroit, 3.35c; Toledo, 3.40c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 3.80c; Detroit, del., 3.95c; eastern Mich., 4.00c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.45c; San Francisco (base, del.), 3.03c; Los Angeles (base, del.), 3.025c; Seattle, 2.985c, base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.60c-2.95c.

Iron Bars: Single refined, Pittsburgh, 6.15c-†6.70c; double refined, 7.00-†8.50c; Pittsburgh, staybolt, 7.85c-†10.00c.

† Hand puddled.

Sheets

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 2.50c; Detroit, del., 2.65c; eastern Mich., del., 2.70c; Philadelphia, del., 2.70c; New York, del., 2.79c; Los Angeles (base, del.), 3.24c; San Francisco, (base, del.), 3.245c. (Andrews Steel Co., quotes Middletown, O., base for shipment to Detroit; Alan Wood Steel Co., Conshohocken, Pa., quotes 3.10c, Sparrows Point, Md., base; Granite City Steel Co., 2.875c, fob Granite City, Ill., 2.775c, fob Gary or Birmingham.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.20c; Granite City, base, 3.30c; Detroit, del., 3.35c; eastern Mich., del., 3.40c; New York, del., 3.61c; Philadelphia, del., 3.58c.

Galvanized Sheets, No. 10: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, Sparrows Point, Canton, Middletown, base 3.55c; New York, del., 3.84c; Philadelphia, del., 3.75c; Los Angeles (base, del.), 4.32c; San Francisco (base, del.), 4.325c.

Corrugated Galvanized Sheets, No. 10: Pittsburgh, Chicago, Gary, Birmingham, base, 3.55c.

Culvert Sheets, No. 16, corrugated: Pittsburgh, Chicago, Gary; Birmingham: Copper alloy, 4.15c; copper-iron or pure iron, 4.50c. Granite City base prices 10 points higher. Los Angeles (base, del.), 4.94c; San Francisco (base, del.), 4.945c.

Aluminized Sheets, No. 20: Hot-dipped, coils or cut to lengths: Pittsburgh, 9.00c.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 3.55c.

Enameling Sheets, No. 12: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.55c; Granite City, base, 3.65c; Detroit, del., 3.70c; eastern Mich., 3.75c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.20c; Kokomo, Ind., 4.30c. Armature: Pittsburgh, Chicago, Gary, 4.50c; Granite City, Ill., Kokomo, Ind., 4.60c. Electrical: Pittsburgh, Chicago, Gary, 5.00c; Granite City, Kokomo, 5.10c. Motor: Pittsburgh, Chicago, Gary, 5.75c; Granite City, 5.85c. Dynamo: Pittsburgh, 6.45c; Granite City, 6.55c. Transformer 72, 6.95c; 65, 7.65c; 58, 8.35c; 52, 9.15c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, base, 2.50c; Detroit, del., 2.65c; eastern Mich., del., 2.70c. (Superior Steel Corp., 3.30c, Pittsburgh.)
Cold-Rolled Strip, 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.20c; Chicago, base, 3.30c; Detroit, del. 3.35c; eastern Mich., 3.40c; Worcester, base, 3.40c. (Superior Steel Corp., 4.70c, Pittsburgh.)
Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.20c; over 0.40 to 0.60 carbon, 4.70c; over 0.60 to 0.80, 5.30c; over 0.80 to 1.00, 6.80c; over 1.00, 9.10c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., 100-lb base box, $5.75; Granite City, Birmingham, Sparrows Point, $5.85.
Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., 100-lb base box 0.25 lb tin, $4.85; 0.50 lb tin, $5.05; 0.75 lb tin, $5.25; Granite City, Birmingham, Sparrows Point, $4.95, $5.15, $5.35, respectively.
Tin Mill Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage and lighter, 3.60c; Granite City, Birmingham, Sparrows Point, 3.70c.
Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-lb base box $4.90; Granite City, Birmingham, Sparrows Point, $5.00.
Roofing Ternes: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $13.50; 15-16 $15.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.65c; Coatesville, Claymont, Geneva, Utah, 2.80c; New York, del. 2.94c; Phila., del., 2.85c; St. Louis, del., 2.47c; Boston, del., 2.86c; San Francisco and Los Angeles, del., 3.29c-3.46c.
(Central Iron & Steel Co., Harrisburg, Pa., 3.85c, basing points; Alan Wood Steel Co., Conshohocken, Pa., 2.80c, Coatesville and Claymont equivalent.)
Floor Plates: Pittsburgh, Chicago, 3.90c.
Open-Hearth Alloy Plates: Pittsburgh, Chicago, 3.787c; Coatesville, 4.15c.
Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 29.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.50c; New York, del., 2.70c; Phila., del., 2.64c; Geneva, Utah (base, del), 2.675c; Los Angeles (base, del.), 3.17c-3.41c; Los Angeles and San Francisco (sizes produced at Geneva only), del., 3.14c; Kaiser, del., San Francisco, 3.41c.
(Phoenix Iron Co., Phoenixville, Pa., nominally, 4.00c, fob Phoenixville.)
Steel Piling: Pittsburgh, Chicago, Buffalo, $3 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).
Wire to Manufacturers in carloads
Bright, basic or bessemer.....*$3.30–$3.55
Spring (except Birmingham).....**$4.25
Wire Products to Trade
Nails and Staples
Standard and cement-coated.....†$3.75–$4.50
Galvanized .....‡$3.75–$4.50
Wire, Merchant Quality
Annealed (6 to 8 base) ..... $$3.95
Galvanized (6 to 8 base)..... $$4.40
(Fob Pittsburgh, Chicago, Birmingham, per base column)
Woven fence, 15 gage and heavier.... ††84
Barbed wire, 80-rod spool..... ††94
Barbless wire, twisted..... 94
Fence posts (no clamps)..... ††90
Bale ties, single loop..... ††86

* Worcester, $3.40, Duluth, $3.35, base. San Francisco (base, del.) $4.31 for bright basic only.
** Worcester $4.35, Duluth and Trenton, N. J., $4.50, base. San Francisco (base, del.) $5.63 for MB spring wire; $5.28 black premier.
† Worcester $4.05, Cleveland $3.85, base. San Francisco (base, del.) $4.83.
‡ Duluth $3.75, Cleveland $3.85, base. San Francisco (base, del.) $4.83.
§ Worcester $4.05, annealed; $4.50, galvanized. Duluth $3.95, annealed; $4.40, galvanized base. San Francisco (base, del.) $4.96, annealed; $5.41, galvanized.
†† San Francisco (base, del.): Woven fence, 107; barbed wire, 114; bale ties, 110. Duluth (base): Woven fence, 84; barbed wire, 94; fence posts, 90.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.50 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $2.85 per 100 lb; light rails (rail steel), $2.95, Williamsport, Pa.
Relaying, 60 lb and over, fob railroad and basing point, $46-$49 per net ton.
Supplies: Track bolts, 6.50c; heat treated, 6.75c. Tie plates, $2.80 per 100 lb, fob mill; $3.15 base, Seattle. Splice bars, $3 per 100 lb. Standard spikes, 3.65c-4.50c; screw spikes, 5.30-6.40c.

Tubular Goods

Standard Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

Butt Weld

Steel			Iron		
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	48	23	¼	— 2	+20
¼ & ⅜	51	30½	⅜–½	—11½	+10
½	55½	41	¾–1	—17	+ 2
¾	58½	45	1¼	—22½	— 1½
1-3	60½	47½	2	—23	— 2

Lap Weld

Steel			Iron		
In.	Blk.	Gal.	In.	Blk.	Gal.
2	53	39½	1¼	— 1	+20
2½-3	56	42½	1½–2	— 7	+13
3½-6	58	44½	2½–4	—14½	+ 5½
*8	58	42½	2½-3½	—17	+ 1½
*10	57½	42	4	—21	— 4
*12	56½	41	4½-8	—19	— 2½
			9-12	—10	+ 7

* Not T. & C.

Seamless
Steel

In.	Blk.	Gal	In.	Blk.	Gal
2	52	38½	*8	57	42
2½-3	55	41½	*10	56½	42
3½-6	57	43½	*12	55½	41

* Not T. & C.

Line Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Seamless	In.	Butt Weld
2	51	⅛	47
2½ & 3	54	¼ & ⅜	50
3½ to 8	56	½	54½
10	55½	¾	57½
12	54½	1 to 3	59½

Boiler Tubes: Net base prices per 100 feet, fob Pittsburgh, in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

O.D. Sizes	B.W.G.	—Seamless— Hot Rolled	Cold Drawn	—Elec. Weld— Hot Rolled	Cold Drawn
1″	13	....	$10.89	$10.62	$10.62
1¼″	13	....	12.90	10.59	12.58
1½″	13	$12.00	14.26	11.70	13.90
1¾″	13	13.65	16.23	13.31	15.82
2″	13	15.29	18.17	15.00	17.95
2¼″	13	17.05	20.26	16.71	20.00
2½″	12	18.78	22.31	18.38	22.00
2½″	12	20.57	24.43	20.11	24.07
2¾″	12	21.80	25.89	21.27	25.46
3″	12	22.87	27.18	22.26	26.68
3¼″	11	26.88	31.94	26.15	31.33
3½″	11	28.86	34.30	28.06	33.64
4″	10	35.82	42.55	34.78	41.68
4½″	9	47.48	56.42	....	....
5″	9	54.96	65.30	....	....
6″	7	84.38	100.25	....	....

Pipe, Cast Iron: Class B, 6-in. and over $65 per net ton, Birmingham; $70, Burlington, N. J.; $75.56, del., Chicago; 4-in. pipe, $5 higher, Class A pipe, $3 a ton over class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length 55 off
⅝ and ⅝, up to 6 in. in length..... 52 off
¾ x 6 in. ..... 49 off
⅞ and 1 in. x 6 in. length..... 51 off
1⅛ in. and larger in all lengths and ⅛ in. and larger in lengths over 6 in. .. 48 off
½ in. and smaller, longer than 6 in. ... 45 off
Tire bolts .....38½ off
Step bolts ..... 46 off
Plow bolts ..... 57 off

Stove Bolts

In packages, nuts separate, 60-10 off; bulk 74 off on 15,000 of 3-in. and shorter, or 5000 over 3-in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in. and smaller.....	51 off	.....
1-in. and smaller.....		48 off
1⅛-in.-1-in.	48 off	.....
1⅛-in.-1-in.	.....	47 off
1⅛-in.-1½-in.	46 off	45 off
1⅝-in. and larger.....	.....	44 off

Additional discount of 15 for full containers.

Hexagon Cap Screws

Upset 1-in., smaller (10-20 bright).... 56 off
Upset (10-35 heat treated)
⅝ x 6 ..... 51 off
¾, ⅞, & 1 x 6..... 47 off

Square Head Set Screws

Upset 1-in. and smaller..... 61 off
Headless, ¼-in. and larger..... 46 off
No. 10 and smaller..... 56 off

Rivets

Fob Pittsburgh, Cleveland, Chicago Birmingham

Structural 5.25c
Lebanon, Pa. 5.40c
⅞-in. and under.....55-5 off
Lebanon, Pa. .....55-5 off plus 15c per cwt.

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers.
lcl ..... $1.50-$2.00 off

Tool Steels

Tool Steel: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per bbl; reg. carbon 16.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base, per lb
18.00	4	1	...	74.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	62.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, Cents per lb

Grade	Bars, Drawn Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301....	26.00c	29.50c	37.00c	22.00c	28 00c
302....	26.00	29.50	37.00	23.50	30.50
303....	28.50	31.50	39.00	29.50	36.00
304....	27.50	31.50	39.00	25.50	32.50
308....	31.50	37.00	44.50	31.00	38.00
309....	39.00	43.50	51.00	40.50	51.00
310....	53.50	56.50	57.50	53.00	61.00
316....	43.50	48.00	52.00	43.50	52.00
321....	31.50	37.00	44.50	32.00	41.50
347....	36.00	41.50	49 00	36.00	45.50
431....	21.00	24.00	31.50	19.00	24.50
440A ..	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
403....	23.50	27.00	32.00	23.00	29.50
410....	20.50	23.50	29.00	18.50	24.00
416....	21.00	24.00	29.50	20.00	25.50
420....	26.00	31.00	36.50	26.00	39.50
430....	21.00	24.00	31.50	19.00	24.50
430F ..	21.50	24.50	32.00	20.50	27.00
442....	24.50	28.00	35.50	26.00	35.00
443....	24.50	28.00	35.50	26.00	35.00
446....	30.00	33.00	39.50	38.00	56.50
*501...	9.00	13.00	17.50	13.00	18.50
*502...	10.00	14.50	18.50	14.50	19.50
†STAINLESS CLAD STEEL (20%)					
304....	....	24.00	22.00	....	....
410....	....	22.00	20.00	....	....
430....	....	22.50	20.50	....	....
446....	....	29.00	27.00	....	....

* Low chromium. † Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax

Pig Iron

Prices per gross ton	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$34.50	$34.00	$35.50	$35.00
Newark, N. J., del.	36.34	35.84	37.34	36.84
Brooklyn, N. Y., del.	37.50	....	....	38.00
Birdsboro, Pa., base	34.50	34.00	35.50	35.00
Philadelphia, del.	36.02	35.52	37.02	36.52
Birmingham, base	29.88	29.38	34.50	....
Baltimore, del.	36.28	....	....	....
Chicago, del.	34.12	....	....	....
Cincinnati, del.	34.75	34.25	....	....
Newark, N. J., del.	35.96	....	....	....
Philadelphia, del.	35.13	....	....	....
St. Louis, del.	33.87	33.37	....	....
Buffalo, base	33.00	32.50	34.00	33.50
Boston, del.	39.48	38.98	40.48	39.98
Rochester, del.	34.84	34.34	35.84	35.34
Syracuse, del.	35.50	35.00	36.50	36.00
Chicago, base	33.00	32.50	34.00	33.50
Milwaukee, del.	34.32	33.82	35.32	34.83
Muskegon, Mich., del.	36.83	....	....	37.33
Cleveland, fob furnace	33.00	32.50	34.00	33.50
Akron, del.	35.17	34.17	35.67	35.17
Duluth, base	33.50	33.00	34.50	34.00
Erie, Pa., base	33.00	32.50	34.00	33.50
Everett, Mass., base	29.50	29.00	30.50	30.00
Boston, del.	30.00	29.50	31.00	30.50
Granite City, Ill., base	33.50	33.00	....	33.50
St. Louis, del.	34.25	33.75	....	34.25
†**Neville Island, Pa.,** base	33.50	33.00	34.00	33.50
Pittsburgh, del., N. & S. Sides	34.33	33.83	34.83	34.33
Provo, Utah, base	33.50	33.00	....	....
Seattle, Tacoma, Wash., del.	38.60	....	....	....
Portland, Oreg., del.	38.60	....	....	....
Sharpsville, Pa., base	33.50	33.00	34.00	33.50
Steelton, Pa., base	34.50	34.00	35.50	35.00
Swedeland, Pa., base	35.50	35.00	36.50	36.00
Troy, N. Y., base	34.50	34.00	35.50	35.00
Toledo, O., base	33.00	32.50	34.00	33.50
Cincinnati, del.	36.50	36.00	....	....
Youngstown, O., base	33.50	33.00	34.00	33.50
Mansfield, O., del.	36.48	35.98	36.98	36.48

† To Neville Island base add: 66c for McKees Rocks, Pa.; $1.01 Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; 97c (water), Monongahela; $1.33, Oakmont, Verona; $1.49 Brackenridge.

Exceptions to above prices: Kaiser-Frazer Parts Corp., Struthers, O., charges 50 cents a ton in excess of Sharpsville, Pa., basing point price for No. 2 foundry, basic, bessemer and malleable pig iron.

High Silicon Silvery

6.00-6.50 per cent (base).....$40.50
6.51-7.00..$41.50 9.01- 9.50. 46.50
7.01-7.50.. 42.50 9.51-10.00. 47.50
7.51-8.00.. 43.50 10.01-10.50. 48.50
8.01-8.50.. 44.50 10.51-11.00. 49.50
8.51-9.00.. 45.50 11.01-11.50. 50.50

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

Electric Furnace Ferrosilicon: Si 14.01-14.50%, $65.75, Jackson, O.; $67, Niagara Falls; $68, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.... $40.50 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $33.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., Birdsboro, Pa., $39, base; Philadelphia, $41.16, del. Intermediate phosphorus, Central furnace, Cleveland, $36.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace..	*$8.75–$9.50
Connellsville, foundry .	9.75–11.00
New River, foundry...	12.50
Wise county, foundry.	11.15
Wise county, furnace..	10.65

* Operators of hand-drawn ovens using trucked coal, $9.35-$10.10.

Foundry Coke

Kearney, N. J., ovens.	$15.35
Chicago, outside del...	15.10
Chicago, del.	16.10
Terre Haute, del.	15.60
Milwaukee, ovens	15.85
New England, del.	17.25
Birmingham, Del.	13.25
Indianapolis, ovens ...	14.50
Cincinnati, del.	15.35
Ironton, O., ovens....	13.35
Painesville, ovens	14.60
Cleveland, del.	15.90
Buffalo, del.	16.10
Detroit, del.	15.75
Philadelphia, ovens ...	14.50
Portsmouth, O., ovens.	14.00
Fairmont, W. Va., ovens	13.75
Pittsburgh, del.	15.61

Coal Chemicals

Spot, gal, freight allowed east of Omaha. Effective as of Apr. 1, 1947

Pure and 90% benzol.....	19.00c
Toluol, two degrees.....	23.00c
Industrial xylol	23.00c
Solvent naphtha	26.00c

Per pound fob works

Phenol (car lots, returnable drums)	11.25c
Do., less than carlots.....	12.00c
Do., tank cars.....	10.25c

Eastern plants, per pound

Naphthalene flakes, balls, bbl, to jobbers, "household use"	9.50c

Per ton, bulk, fob plants

Sulphate of ammonia.....	$30.00

Refractories

Per 1000, fob shipping point. Net Prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$87.00

High Heat Duty

Pa., Ill., Md., Mo., Ky.	70.00
Ala., Ga.	70.00
N. J.	76.00

Intermediate Heat Duty

Ohio	64.00
Pa., Ill., Md., Mo., Ky.	64.00
Ala., Ga.	56.00
N. J.	67.00

Low Heat Duty

Pa., Md., Ohio.....	56.00

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry Press	47.00
Wire Cut	45.00

Malleable Bung Brick

All bases	80.00

Silica Brick

Pennsylvania	70.00
Joliet, E. Chicago.....	79.00
Birmingham, Ala.	70.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk	24.00
Single bags	28.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	59.00
Chem. bonded chrome.....	59.00
Magnesite brick	81.00
Chem. bonded magnesite....	70.00

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer.....	$5.95
Old range nonbessemer.....	5.80
Mesabi bessemer	5.70
Mesabi nonbessemer	5.55
High phosphorus	5.55

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

N. African low phos.....	Nom.
Swedish basic, 60 to 68%..	13.00
Spanish, No. African basic, 50 to 60%.....	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50–6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$27–$28

Manganese Ore

46-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 63.00c-67.00c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio .....$27-$27.50	
45% no ratio	28.00
48% no ratio	30.00
50% no ratio	31.00
Brazilian—nominal	
44% 2.5:1 lump	$33.65
48% 3:1 lump	43.50
Rhodesian	
45% no ratio $27-27.50	
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

HIGH-STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Bethlehem	Canton	Massillon
Sheets, Hot-Rolled	3.75–3.85	3.75–3.85	3.75–3.85	3.85	3.85	3.75–3.85	...	...	...
Cold-Rolled	4.55–4.75	4.55–4.75	4.55–4.75	4.75	...	4.55–4.75	...	...	...
Galvanized	5.40	.....	.....	...	...	.....	...	...	...
Strip, Hot-Rolled	3.75–3.85	3.75–3.85	3.75–3.85	3.85	...	.....	...	...	...
Cold-Rolled	4.55	4.65	4.65	4.65	...	.....	...	...	...
Shapes, Structural	3.85	3.85	.....	3.85	...	.....	3.85	...	...
Plates	4.10	4.10	4.10	...	4.10	.....	...	...	...
Bars and Bar Shapes.	4.00	4.00	4.00	4.00	...	4.00	...	4.00	4.00

Note: Lower level of quoted ranges represent prices for NAX High Tensile, produced by Great Lakes Steel Corp., Detroit.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras

	SHEETS					STRIP		BARS				PLATES	
	H-R 10G	C-R 10G	C-R 17G	Gal. •10G	Gal. •24G	†H-R	†C-R	H-R	C-R	H-R Alloy (§4140)	Structural Shapes	Carbon ¾"-¾"	Floor ¾" & Thicker
Boston (city)	4.50	5.67[4]	5.22[4]	5.55[4]	6.80[4]	4.65	6.36	4.62	5.22	7.12	4.47	4.70	6.42
††New York (city)	4.42	....	5.27[8]	5.47[8]	....	4.62	....	4.62	5.17	8.42[13]	4.37	4.72	6.35
New York (country)	4.32	....	5.17[8]	5.37[8]	....	4.52	....	4.52	....	....	4.27	....	6.25
Philadelphia (city)	4.24	5.73[5]	5.33[5]	5.29[5]	6.54[5]	4.43	5.28	4.48	5.38	6.87	4.22	4.44	5.93
Philadelphia (country)	4.14	5.63[5]	5.23[5]	5.19[5]	6.44[5]	4.33	5.18	4.38	....	6.60	4.12	4.84	5.83
Baltimore (city)	4.09	6.15[5]	5.65[5]	5.14[5]	6.39[5]	4.40	..	4.45	5.10	....	4.34	4.39	5.90
Baltimore (country)	3.59	6.05[5]	5.55[5]	....	....	....	....	....	....	....	4.24	4.29	5.80
Washington (city)	4.35	....	....	5.18[5]	6.43[5]	4.65	....	4.70	5.60[11]	....	4.60	4.65	6.60
Norfolk, Va.	4.35	....	....	....	....	....	....	4.75	5.50	....	4.50	4.50	6.25
Buffalo (city)	4.05	....	4.75[6]	5.35[5]	....	4.30	5.25	4.10	4.75	....	4.10	4.65	5.90
Buffalo (country)	3.90	....	4.60[6]	4.95[5]	....	3.90	4.85	3.95	4.60	6.60	3.95	4.20	5.45
Pittsburgh (city)	4.15	5.15[5]	4.85[5]	5.10[5]	6.35[5]	4.05	5.00	4.10	4.75	6.60	4.10	4.25	5.60
Pittsburgh (country)	4.00	5.00[5]	4.70[5]	4.95[5]	6.20[5]	3.90	4.85	3.95	4.60	6.60	3.95	4.10	5.45
Youngstown, O. (city)	4.188	5.338	4.888	5.05	6.30	4.00	....	4.238	5.138	....	4.218	4.488	5.178
Youngstown, O. (country)	....	....	....	4.95	6.20	3.90	....	....	....	....	....	....	....
Detroit	4.15	5.30	4.85	5.42	6.67	4.34	5.24	4.20	4.87[12]	7.01	4.42	4.49	5.92
Cleveland (city)	4.15	5.15[5]	4.85[5]	5.238[5]	6.488[5]	4.188	5.10	4.10	4.75	6.858	4.311	4.25	5.961
Cleveland (country)	4.00	5.00[8]	4.70[8]	....	....	3.90	4.95	3.95	4.60	....	....	4.10	....
Cincinnati	4.116	5.266[8]	....	5.166[8]	....	4.394	....	4.403	5.308	....	4.444	4.553	5.944
Chicago (city)	4.05	5.20[8]	4.75[8]	5.10[8]	6.35[8]	4.05	5.10	4.10	4.75	6.60[13]	4.10	4.25	5.75
Chicago (country)	3.90	5.05[8]	4.60[8]	4.95[8]	6.20[8]	3.90	4.95	3.95	4.60	6.60[13]	3.95	4.10	5.60
Milwaukee	4.249	5.399[8]	4.949[8]	5.299[8]	6.549[8]	4.249	5.299	4.299	4.949	6.899	4.299	4.449	5.949
St. Paul	4.384[1]	5.534[8]	5.084[8]	5.434[8]	6.684[8]	4.404[18]	....	4.434[18]	5.726[11]	7.084[11]	4.434[18]	4.684[18]	6.084[18]
Indianapolis	4.04	...	4.84[8]	5.29[8]	6.54[8]	4.24	....	4.36‡‡	5.26	....	4.36	4.61	6.01
St. Louis	4.299	5.299	4.999[9]	5.424[5]	6.674[5]	4.199	....	4.249	5.074[12]	7.074	4.249	3.999	5.899
Birmingham (city)	3.85[20]	....	....	5.20[8]	....	4.10[20]	....	4.05[20]	5.83	....	4.05	4.30 •	6.56
Birmingham (country)	3.75[20]	....	....	5.20[8]	....	4.00[20]	....	3.95[20]	....	....	3.95	4.20	....
New Orleans	4.46[20]••	....	5.77[8]	....	....	4.83[20]	....	4.78[20]•••	5.94[11]	....	4.68[20]••	5.03[20]	6.94[20]
Houston, Tex.	5.00[1]	....	....	6.00	....	6.00[1]	....	5.35[1]	....	6.35	5.85	5.85	6.40
Omaha, Nebr.	4.868	6.118[8]	....	5.918[8]	7.168[8]	4.862	....	4.918	5.818[11]	....	4.918	5.068	6.568
Los Angeles	5.55	....	7.10[8]	....	8.10[8]	5.65	8.35	5.10	6.90[19]	7.85	5.20	5.10	7.20
San Francisco	4.90§§	....	6.30[8]	....	7.35[8]	5.20[14]	8.35[14]	4.75[14]	•••	9.35[18]	4.90[14]	5.00[14]	6.80[14]
Tacoma, Wash.	....	....	....	6.30[8]	....	5.30[17]	....	5.00[17]	7.10[19]	8.50[19]	4.95[17]	5.15[17]	7.25[17]
Seattle	5.00[17]	....	....	6.30[8]	....	5.30[17]	....	5.00[17]	7.10[19]	8.50[19]	4.95[17]	5.15[17]	7.25[17]

Base Quantities: 400 to 1999 pounds except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 pounds and over; [1]—any quantity; [2]—300 to 1999 pounds; [3]—150 to 2249 pounds; [4]—three to 24 bundles; [5]—450 to 1499 pounds; [6]—one bundle to 1499 pounds; [7]—one to nine bundles; [8]—400 to 1499 pounds; [9]—1000 to 1999 pounds; [10]—450 to 39,999 pounds; [11]—1000 to 39,999 pounds; [12]—1000 pounds and over; [13]—400 to 14,999 pounds; [14]—400 to 39,999; [15]—2000 lb and over; [16]—1000 to 4999; [17]—300 to 9999 pounds; [18]—1500 to 1999 pounds; [19]—1500 to 39,999; [20]—400 to 3999 pounds.

• Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ basing point cities with quotations representing mill prices plus warehouse spread; § as rolled, except New York, Jersey City, Indianapolis and San Francisco where price represents annealed bars; •• add 0.46 for sizes not rolled in Birmingham; †† same prices quoted for Jersey City, N. J.; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier; ••• rounds under ⅜ in. 7.00c, ⅜ in. and over 6.50c, squares, hexagons and flats 6 in. and narrower 7.50c, flats over 6 in. 8.25c at San Francisco.

PRICES OF LEADING FERROALLOYS PRODUCTS

Spiegeleisen: 19-21% Mn, 1-3% Si, carlot per gross ton, Palmerton, Pa., $44; Pittsburgh, $48. 16% to 19% Mn, Pittsburgh, $47.

Ferromanganese, standard: 78-82% c.l. gross ton, duty paid, $135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); $140.25 fob cars, Pittsburgh, including 75c switching charge, (where Carnegie-Illinois Steel Corp. is producer); add $8 for packed c.l., $10 for ton, $13.50 for less ton; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.30c; regular, 21.20c; medium, 15.20c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Ferromanganese Briquets: (Weight approx. 3 lb and containing exactly 2 lb Mn) Prices per lb of briquets: Contract, bulk, carlots, 7.00c, packed, carlots, 7.60c, ton lots, 8.00c, smaller lots 8.40c, eastern, freight allowed; 7.25c, 7.85c, 8.60c and 9.00c, central; 7.80c, 8.40c, 10.50c and 10.90c, western; spot up 0.25c; notched, up 0.25c.

Ferrotungsten: Spot, 10,000 lb or more, per lb contained W, $2.27; contract, $2.25; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots $1.23; smaller lots $1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum C; per lb contained Ti; ton lots $1.35; smaller lots $1.40 eastern. Spot up 5c per lb.

Ferrotitanium, High-Carbon: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

Ferrovanadium: V 0.35-0.55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Ferromolybdenum: 55-75% per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of $3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.l. 13.80c, ton lots 14.30c, smaller lots 14.80c; 75%, c.l. 11.05c, ton lots 11.65c, smaller lots 12.25c; 50%, c.l. 9.00c, ton lots 9.65c, smaller lots 10.30c. Deduct 1.00c for bulk, carlots, 80-90% and 90-95%; 1.05c, 75%; 1.20c, 50%. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%.

Ferroboron: (B 17.50% max. and C 1.50% max., Al 0.50% max. and C 0.50% max.) Prices per lb of alloy, contract, ton lots $1.20, smaller lots $1.30, eastern, freight allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

Ferrocolumbium: 50-60%, per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.50; smaller lots $2.55. Spot up 10c.

Ferrochrome: Contract, lump, packed; **high carbon,** eastern zone, c.l. 16.20c, ton lots 16.80c; central zone, add 0.40c and 1.30c; western zone, add 0.55c and 2.10c. Deduct 0.60c for bulk carlots. **High carbon, high nitrogen,** add 5c to all high carbon ferrochrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c. **Low carbon,** eastern zone, bulk, c.l., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22.00c, 0.2% 21.75c; 0.5% 21.50c, 1% 21.00c, 2% 20.50c; add 1.35c for 2000 lb to c.l.; central zone, add 0.4c for bulk, c.l.; and 0.65c for 2000 lb to c.l.; western zone, add 0.5c for bulk, c.l., and 1.85c for 2000 lb to c.l.; carlot packed differential 0.80c. Prices are per lb of contained Cr, freight allowed.

Low carbon, high nitrogen: Add 2c to low carbon ferrochrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

Ferrochrome, Special Foundry: (Cr 62-66%, C above 5-7%.) Contract, 2-inch x D, packed, eastern zone, freight allowed, c.l. 17.05c, ton lots 17.60c, smaller lots 18.30c; central zone, add 0.40c for c.l. and 1.30c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.60c for bulk carlots.

S. M. Ferrochrome, high carbon: (Cr 60-65%, Si, Mn and C 4-6% each.) Contract, lump, packed, eastern zone, freight allowed, c.l. 17.30c, ton lots 17.90c, smaller lots 18.60c; central zone, add 0.40c for c.l. and 1.30c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Prices are per pound of contained chromium, spot prices 0.25c higher. Deduct 0.60c for bulk carlots.

S. M. Ferrochrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk 21.00c; packed carlot 21.80c, ton lots 22.35c, smaller lots 23.35c, eastern, freight allowed, per pound of contained Cr; 21.40c, 22.20c, 23.00c, and 24.00c, central; 21.50c, 22.30c, 24.20c and 25.20c, western spot up 0.25c.

Ferrochrome Briquets: Containing exactly 2 lb Cr, packed eastern zone, c.l. 10.35c, ton lots 10.75c, smaller lots 11.15c; central zone, add 0.25c for c.l. and 0.90c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.50c for bulk carlots. Prices per pound of briquets; spot prices 0.25c higher; notched, 0.25c higher.

Chromium Metal: 97% min. Cr, max. 0.50% C, eastern zone, per lb contained Cr bulk, c.l. 79.50c, 2000 lb to c.l. 80c; central 81c and 82.60c; western 82.25c and 84.75c, fob shipping point, freight allowed.

Chromium-Copper: (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) Contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Calcium metal; cast: Contract, ton lot or more, $1.60; 100 to 1999 lb, $1.95; less than 100 lb, $3.15 per lb of metal, eastern zone; $1.615, $1.965 and $3.185, western; spot up 5c.

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb of alloy. Contract, carlots, packed, 16.10c, ton lots 17.60c, smaller lots 18.60c, eastern, freight

allowed; 16.60c, 18.45c, 19.45c, central; 18.65c, 20.20c, 21.20c, western; spot up 0.25c.

Calcium - Silicon: (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb of alloy, Contract, lump, packed, carlots 14.60c, ton lots 16.10c, smaller lots 17.10c, eastern, freight allowed; 15.10c, 16.85c, 17.85c, central; 17.15c, 19.00c, 20.00c, western; spot up 0.25c.

Silicon Metal: Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l. 14.50c; 2000 lb to c.l. 16.00c; central zone, 15.10c and 18.25c; western, 15.70c and 20.00c; min. 96% Si and max. 2% Fe, eastern, bulk, c.l. 14.10c; 2000 lb to c.l. 15.60c; central 14.70c and 17.85c; western, 15.30c and 19.60c, fob shipping point, freight allowed. Price per lb contained Si.

Silicomanganese Briquets: Containing exactly 2 lb Mn and about ½ lb Si, eastern zone, bulk, c.l. 6.75c, ton lots 7.75c; central zone, add 0.25c for c.l. and 0.60c for ton lots; western, add 0.80c for c.l. and 2.50c for ton lots. Notched, up 0.25c.

Silicon Briquets: Weighing about 5 lb and containing exactly 2 lb Si, packed, eastern zone, c.l. 4.70c, ton lots 5.10c, smaller lots 5.50c; weighing about 2½ lb and containing 1 lb Si, packed, eastern zone, c.l. 4.85c, ton lots 5.25c, smaller lots 5.65c; notched 0.25c higher; central zone, add 0.25c for c.l. and 0.60c for smaller lots; western zone, add 0.45c for c.l. and 0.90c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.50c for bulk carlots.

Manganese Metal: (Min. 96% Mn., max. 2% Fe), per lb of metal, eastern zone, bulk, c.l. 30c, 2000 lb to c.l., 32.00c; central 31.00c and 33.45c; western, 31.45c and 34.40c.

Electrolytic Manganese: 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more: Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1½c for hydrogen-removed metal.

Manganese-Boron: (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) Prices per lb of alloy. Contract, ton lots $1.89, less $2.01, eastern, freight allowed; $1.903 and $2.023, central; $1.935 and $2.055, western; spot up 5c.

Nickel-Boron: (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max, Ni, balance). Prices per lb of alloy: Contract, 5 tons or more $1.90, 1 ton to 5 tons $2.00, smaller lots $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

Borosil: 3 to 4% B, 40 to 45% Si; $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: B 1.5-1.9%, ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: B 0.90 to 1.15% net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%) Prices per lb of alloy, contract, or spot carlots 35.00c, ton lots 37.00c, smaller lots 39.00c, eastern, freight allowed; 35.30c, 38.10c and 40.10c, central; 35.30c, 40.05c and 42.05c, western; spot up 0.25c.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) Prices per lb of alloy, contract, carlots 13.50c, ton lots 14.25c, smaller lots 15.00c, eastern zone, freight allowed; 13.80c, 15.35c, 16.10c, central; 13.80c, 17.30c, 18.05c, western; spot up 0.25c.

CMSZ Alloys 4 & 5: (Alloy 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3.00-4.50%; alloy 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%). Prices per lb of alloy, contract or spot, bulk, carlots 14.50c; packed, carlots 15.25c, ton lots 16.00c, smaller lots 16.75c, eastern, freight allowed; 14.80c, 15.55c, 17.10c, 17.85c, central; 14.80c, 15.55c, 19.05c, 19.80c, western.

Zirconium alloy: 12-15%, per lb of alloy, eastern, contract, bulk, carlots 5.50c, packed, carlots 6.05c, ton lots 6.40c, smaller lots 6.75c; spot up 0.25c.

Zirconium alloy: Zr 35-40%, eastern, contract, packed, carlots 17.00c, ton lots 17.75c, smaller lots 19.00c; spot up 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb 6.25c; ton lots 6.75c; smaller lots 7.25c. Spot up ½c.

Simanal: (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, smaller lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Tungsten Metal Powder: Spot, not less than 98.8%, $2.90, freight allowed as far west as St. Louis.

Grainal: Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

Vanadium Pentoxide, technical grade: Fused, approx. 89-92% V_2O_5 and 5.84% Na_2O; or air dried, 83-85% V_2O_5 and 5.15% Na_2O, $1.10 per lb contained V_2O_5 fob plant freight allowed on quantities of 25 lb and over to St. Louis.

Copper, Brass Product Prices Advance

Mills raise prices to cover increased costs . . Major primary metal prices hold

NEW YORK—Developments in nonferrous metal markets last week indicated that adjustments to postwar conditions are still in full swing. Leading brass mills advanced copper and copper-base alloy products so as to include increased costs of copper, labor and supplies, while wire producers advanced prices to the basis of 23 cents a pound for refined copper, which represents the approximate average copper cost. At least one large brass mill is now selling on a fixed price basis for a 60-day period ahead.

Legislation to extend allocation and priority powers over tin, tin products, and antimony for a period of one year from June 30 was requested of Congress by President Truman last week. He also said that it is necessary to continue the power to issue export priorities.

Early removal of Canadian price ceilings on copper, lead and zinc is predicted unofficially in Ottawa, Canada. Most of the production is exported but producers are required to satisfy needs of users in that country at the following prices: Copper, 16.625c; lead, 10.63c; and zinc, 10.25c. Arguments for lifting controls are that world prices appear to have been permanently stabilized at a higher level and that the end products made from these metals are already freed from control.

COPPER—Domestic market remained confused last week with consumers purchasing domestic copper at 21.50c and foreign-origin metal at 24.00c.

There were 121,391 tons of refined copper contained in products shipped during April from brass mills and other important makers of copper and brass alloys. This represented a gain of 3410 tons over March shipments of 117,981 tons. While the volume of copper used last month remained large, the amount of new business booked by the mills and others during April dropped to the lowest level since February, 1946.

Total bookings in April amounted to 83,273 tons, a drop of 48,294 tons from the March total of 131,567 tons and were the smallest since February of last year when the industry booked 63,301 tons. The drop in new business during April was attributed to a growing resistance of copper users, particularly brass mills, to the present high prices for copper.

At the end of April, the amount of unfilled orders on the books of copper and brass product makers totaled 467,221 tons, compared with 505,339 tons at the beginning of the month.

Manufacturers' copper needs at the end of April totaled 751,227 tons, including 467,221 tons for unfilled orders and 284,006 tons for working stocks. To meet this, their supply was 462,526 tons, including 403,082 tons of refined copper held in stocks and 59,444 tons on order with producers. This left an apparent deficit of 288,701 tons. On the same basis at the beginning of the month, the apparent deficit was 303,006 tons.

COPPER AND BRASS PRODUCTS: Anaconda Wire & Cable Co. advanced copper wire prices to the basis of 23.00c a pound; previous prices had been based on 21.50c a pound for copper. New prices for wire are as follows, carlot basis, effective May 26: Bare copper wire, 29.22c; weatherproof wire, 29.39c; magnet wire, 33.63c.

American Brass Co. and Revere Copper & Brass Inc. advanced prices of copper products, effective May 26, generally 2.25c a pound while copper-base alloy products were figured individually and advanced over a wide range. The list of quantity discounts applicable to extras also was changed as follows: Those that were 33 1/3 per cent are now 25 per cent; those that were 25 per cent are now 15 per cent; those that were 20 per cent are now 10 per cent; those that were 15 per cent are now 10 per cent; those that were 10 per cent are now net. With regard to net catalog extras, these are changed as follows: From net plus 12 per cent to net plus 20 per cent; from net plus 24 per cent to net plus 30 per cent; from net to net plus 10 per cent.

LEAD—Despite an advance in the price of lead on Mar. 3 to a new high of 14.80c to 14.85c, East St. Louis, the average daily rate of lead output from domestic mines declined 52 tons, or 5 per cent, from February, according to the Bureau of Mines. The March output, in terms of recoverable metal, was 31,442 tons.

ZINC—Consumption of zinc scrap increased to record 19,977 tons in March from 16,475 tons in February, but the intake of scrap at consuming plants was still higher at 21,395 tons, raising inventories to 35,090 tons, according to the Bureau of Mines. Production of secondary zinc in redistilled slab increased from 4062 tons in February to 5002 tons in March. Demand for primary zinc continued steady last week with prices unchanged on the basis of 10.50c, East St. Louis, for prime western.

TIN—Mine production of tin in the Netherlands East Indies amounted to 1525 long tons of fine tin, an increase of about 100 tons over March to the highest level attained so far this year. During the first four months of this year, 2825 tons were produced at Banka and 2382 at Billiton and Singkep. Production is expected to rise sharply in two or three months when four large dredges now enroute to the Indies start operating. Prices remained firm here at 80.00c for grade A tin.

SILVER—Handy & Harman's "official price" declined 2 cents an ounce last week to 70.75c, due to absence of buying interest at the higher level.

NONFERROUS METAL PRICES

Copper: Electrolytic, carlots 21.50c-24.00c, del. Conn.; Lake, 21.62½c, del. Conn. Dealers may add ¾c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, 21.25c, refinery, 20,000 lb or more; 21.50c, less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 19.50c; 88-10-2 (No. 215) 27.25c; 80-10-10 (No. 305) 23.50c; No. 1 yellow (No. 405) 15.75c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than carloads.

Zinc: Prime western 10.50c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 15.00c-15.25c; No. 12 foundry alloy (No. 2 grade) 14.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 15.50c; grade 2 (92-95%) 14.50c; grade 3 (90-92%) 13.75c; grade 4 (85-90%) 13.25c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00c-56.00c; 25 to 99 lb, 42.00c-46.00c; 100 to 4000 lb, 35.00c-36.00c.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 80.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 79.85c; Grade C, 99.65-99.79% incl. 79.55c; Grade D, 99.50-99.64% incl., 79.40c; Grade E, 99-99.49% incl. 78.90c; Grade F, below 99% (for tin content), 78.70c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c, 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c, effective as of Mar. 15. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 35c lb; 25 lb pigs produced from electrolytic cathodes 36.50c lb; shot produced from electrolytic cathodes 37.50c lb; "F" nickel shots or ingots for additions to cast iron 35.50c lb. Prices include import duty.

Mercury: Open market, spot, New York, $85-$88 per 76-lb flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be, $14.75 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

Cobalt: 97-98%, $1.50 lb for 550 lb (keg); $1.52 lb for 100 lb (case); $1.57 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N. Y., 70.75c per ounce.

Platinum: $59-$62 per ounce.

Palladium: $24 per troy ounce.

Iridium: $85-95 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 23.00c, Connecticut, for electrolytic copper. Freight prepaid on 100 lb or more.)

Sheet: Copper 35.18c; yellow brass 30.63c; commercial bronze, 95% 35.15c, 90% 34.46c; red brass, 85% 33.27c, 80% 32.58c; best quality brass 31.72c; Everdur, Duronze, Herculoy or equiv., cold drawn, 39.88c; nickel silver, 18% 43.21c; phosphor bronze, grade A, 5% 53.42c.

Rods: Copper, cold-drawn, 32.53c; yellow brass, free cutting 25.32c, not free cutting 30.32c; commercial bronze, 95% 34.84c, 90% 34.15c; red brass, 85% 32.96c, 80% 32.27c; best quality brass 31.41c.

Seamless Tubing: Copper 35.22c; yellow brass 33.39c; commercial bronze, 90% 36.87c; red brass, 85% 35.93c, 80% 35.24c; best quality brass 34.13c.

Wire: Yellow brass 30.92c; commercial bronze, 95% 35.44c, 90% 34.75c; red brass, 85% 33.56c, 80% 32.87c; best quality brass 32.01c.

Copper Wire: Bare, soft, fob eastern mills, carlots 29.22c, less carlots 29.72c; weatherproof, fob eastern mills, carlots 29.39c, less carlots 29.89c; magnet, delivered, carlots 32.63c, 15,000 lb or more 32.88c, less carlots 33.38c.

Aluminum Sheets and Circles: 2s and 3s flats, mill finish, base 30,000 lb or more, fob shipping point. Actual transportation charges (not to exceed lowest carload rail freight rate) are deducted on orders for domestic delivery of 500 lb or more of one product to one destination. Widths from 12 in. and diameters from 9 in. to indicated maximum sizes. Prices, cents per lb, effective Jan. 30, 1947.

B. & S. Gage	Max. Width or Diam.	Sheet Base	Circle Base
0.249"-7	48"	23.70	26.20
8-10	48"	24.20	26.70
11-12	26"	24.70	27.50
13-14	26"	24.90	27.90
15-16	26"	25.10	28.20
17-18	26"	25.40	28.60
19-20	24"	25.70	29.00
21-22	24"	26.10	29.50
23-24	24"	26.60	30.20
25	24"	27.10	30.90
26	24"	27.80	31.90
27	24"	28.50	33.00
28	24"	29.20	33.70
29	24"	30.00	34.70
30	24"	30.80	35.80

Lead Products: Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 18.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq ft; 75c, 10 to 20 sq ft and circles. Pipe: Full coils 17.50c; cut coils 17.75c. Lead Traps and Bends: List plus 42%.

Zinc Products: Sheet, 15.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 14.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 13.50c; over 12-in., 14.50c.

Plating Materials

Chromic Acid: 99.75%, flake, fob Philadelphia, carloads, 21.00c; 5 tons and over 21.50c; 1 to 5 tons, 22.00c; less than 1 ton, 22.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 29.84c; oval, 29.34c; electro-deposited, 29.09c; cast, 28.84c.

Copper Carbonate: 52-54% metallic Cu, 50 lb bags, 26.50c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

Sodium Cyanide: 96-98%, ½-oz ball, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 22.00c; 275-lb bbls, 20.00c.

Tin Anodes: Bar, 1000 lb and over 92.50c; 500 to 1000 lb, 93.00c; 200 to 500 lb, 93.50c; less than 200 lb, 94.00c; ball, 1000 lb and over, 94.75c, 500 to 1000 lb, 95.25c, 200 to 500 lb, 95.75c; less than 200 lb, 96.25c, fob Sewaren, N. J.

Tin Chloride: Fob Grasselli, N. J., 625 lb bbls., 60.00c; 100 lb kegs, 60.50c.

Sodium Stannate: To all consumers: in 200 or 500 lb drums, 49.50c; 100 lb, 50.50c; 50 lb, 55.00c; 25 lb, 57.00c.
To consumers other than automobile, radio and refrigerator makers: 1500 lb, 45.85c; 600 to 1400 lb, 48.50c.
To automobile, radio and refrigerator makers: 10,000 lb and over, 44.50c; 2000 to 9999 lb, 45.50c; 1000 to 1999, 46.50c; 600 to 999 lb, 48.50c.

Zinc Cyanide: 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)

Prices for less than 15,000 lb fob shipping point. Add ¾c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.125	14.875	14.250
Commercial Bronze			
95%	18.000	17.750	17.250
90%	17.500	17.250	16.750
Red brass			
85%	17.250	17.000	16.500
80%	16.875	16.625	16.125
Best Quality (71-79%)	16.125	15.875	15.375
Muntz Metal	14.125	13.875	13.375
Nickel silver, 5%	16.125	15.875	8.063
Phos. bronze, A. B.	20.000	19.750	18.750
Naval brass	14.500	14.250	13.750
Manganese bronze	14.500	14.250	13.625

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 18.00c, No. 2 copper 17.00, light copper 16.00, composition red brass 14.75, auto radiators 11.25, heavy yellow brass 10.25, brass pipe 10.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper, 19.37½, No. 2 copper, 17.87½, light copper, 16.87½; refinery brass (60% copper), per dry copper content less $5 smelting charge for brass analyzing 60 per cent or more, nom.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire, No. 1 16.50, No. 2 15.75, light copper 14.50; No. 1 composition red brass 14.00, No. 1 composition turnings 13.00, mixed brass turnings 8.00, new brass clippings 11.50, No. 1 brass rod turnings 11.00, light brass 8.00, heavy yellow brass 9.00, new brass rod ends 11.50, auto radiators, unsweated 10.50, cocks and faucets 11.00, brass pipe 10.00.

Lead: Heavy lead 11.50-12.00, battery plates 6.75-7.25, linotype and stereotype 12.75-13.25, electrotype 10.75-12.25, mixed babbitt 13.50-14.00, solder joints 15.50.

Zinc: Old zinc 5.00-5.50, new die cast scrap 4.00-4.50, old die cast scrap 2.00-2.50.

Tin: No. 1 pewter 50.00-52.00, block tin pipe 67.00-68.00, auto babbitt 40.00-42.00, No. 1 babbitt 40.00-43.00, siphon tops 40.00-42.00.

Aluminum: Clippings, 2S, 8.50-9.00, old sheets 6.50-7.50, crankcase 6.25-6.75, borings and turnings 2.25-3.50, pistons, free of struts, 6.00-6.50.

Nickel: Anodes 19.50, turnings 16.50-17.50, rod ends 19.00-20.00.

Monel: Clippings 14.00-15.00, turnings 9.00-10.00, old sheet 11.00-12.00, rods 12.50-13.00, castings 10.00.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$30.00
No. 2 Heavy Melt. Steel	30.00
No. 1 Busheling	30.00
Nos. 1, 2 & 3 Bundles.	30.00
Machine Shop Turnings.	27.50-28.00
Mixed Borings, Turnings	27.50-28.00
Short Shovel Turnings.	29.50-30.00
Cast Iron Borings	28.50-29.00
Bar Crops and Plate	37.00-37.50
Low Phos. Cast Steel	37.50-38.00
Punchings & Plate Scrap	37.50-38.00
Cut Structurals	37.50-38.00
Elec. Furnace Bundles.	37.50-38.00
Heavy Turnings	31.00-31.50
Alloy Free Turnings	29.50-30.00
No. 1 Chemical Borings	31.00-32.00

Cast Iron Grades

No. 1 Cupola	40.00-41.00
Charging Box Cast	34.00-35.00
Heavy Breakable Cast.	33.00-34.00
Stove Plate	37.50-38.00
Unstripped Motor Blocks	37.50-38.00
Malleable	44.50-45.00
Brake Shoes	35.00-36.00
Clean Auto Cast	40.00-41.00
No. 1 Wheels	42.00-42.50
Burnt Cast	35.00-36.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	34.50-35.00
R.R. Malleable	44.50-45.00
Axles	40.00-41.00
Rails, Rerolling	37.00-37.50
Rails, Random Lengths	35.00-36.00
Rails, 3 ft and under.	39.00-39.50
Rails, 18 in. and under.	41.00-41.50
Railroad Specialties	41.00-42.00
Uncut Tires	38.00-39.00
Angles, Splice Bars	38.00-38.50

CLEVELAND

No. 1 Heavy Melt. Steel	$30.50-31.00
No. 2 Heavy Melt. Steel	30.50-31.00
No. 1 Busheling	30.50-31.00
Nos. 1 & 2 Bundles	30.50-31.00
Machine Shop Turnings.	25.50-26.00
Mixed Borings, Turnings	27.00-28.00
Short Shovel Turnings.	27.00-28.00
Cast Iron Borings	27.00-28.00
Bar Crops and Plate	33.50-34.50
Cast Steel	33.50-34.50
Punchings & Plate Scrap	33.50-34.50
Elec. Furnace Bundles.	31.50-32.00
Heavy Turnings	30.00-30.50
Alloy Free Turnings	29.50-30.00
Cut Structurals	37.50-38.00

Cast Iron Grades

No. 1 Cupola	43.00-45.00
Charging Box Cast	38.00
Stove Plate	38.00
Heavy Breakable Cast.	38.00
Unstripped Motor Blocks	40.00
Malleable	52.00-55.00
Brake Shoes	42.00
Clean Auto Cast	45.00
No. 1 Wheels	42.00
Burnt Cast	38.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-35.00
R.R. Malleable	52.00-55.00
Rails, Rerolling	40.00-41.00
Rails, Random Lengths	38.00-39.00
Rails, 3 ft and under	44.00
Railroad Specialties	42.00
Uncut Tires	41.00
Angles, Splice Bars	44.00

VALLEY

No. 1 Heavy Melt. Steel	$31.00-31.50
No. 2 Heavy Melt. Steel	31.00-31.50
No. 1 Bundles	31.00-31.50
Machine Shop Turnings.	26.00-27.00
Short Shovel Turnings.	28.00-29.50
Cast Iron Borings	28.50-29.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-35.00

MANSFIELD

No. 1 Heavy Melt. Steel	$31.00-31.50
Machine Shop Turnings.	26.00
Short Shovel Turnings.	28.00

CINCINNATI

No. 1 Heavy Melt. Steel	$27.00
No. 2 Heavy Melt. Steel	27.00
No. 1 Busheling	27.00
No. 1 Bundles	27.00
No. 2 Bundles	27.00
Machine Shop Turnings.	20.00
Mixed Borings, Turnings	19.00
Short Shovel Turnings.	22.00
Cast Iron Borings	21.00

Cast Iron Grades

No. 1 Cupola Cast	40.00
Charging Box Cast	31.00
Heavy Breakable Cast.	32.00
Stove Plate	29.00
Unstripped Motor Blocks	32.00
Brake Shoes	28.00
Clean Auto Cast	38.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00
R.R. Malleable	42.00
Rails, Rerolling	35.00
Rails, Random Lengths	35.00
Rails, 18 in. and under.	42.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$26.00-26.50
No. 1 Busheling	26.00-26.50
Nos. 1 & 2 Bundles	26.00-26.50
No. 3 Bundles	26.00-26.50
Machine Shop Turnings.	21.50-22.00
Mixed Borings, Turnings	21.50-22.00
Short Shovel Turnings.	22.50-23.00
Cast Iron Borings	22.50-23.00
Punchings & Plate Scrap	31.00-31.50

Cast Iron Grades

No. 1 Cupola Cast	33.00-34.00
Heavy Breakable Cast.	25.00-27.00
Clean Auto Cast	33.00-34.00

BUFFALO

No. 1 Heavy Melt. Steel	$32.50-33.50
No. 2 Heavy Melt. Steel	29.00-31.00
No. 1 Busheling	29.00-31.00
Nos. 1 & 2 Bundles	29 00-31.00
Machine Shop Turnings	22.00-22.50
Mixed Borings, Turnings	22.00-22.50
Cast Iron Borings	22.00-22.50
Short Shovel Turnings.	24.00-24.50
Punchings & Plate Scrap	34.00-35.00
Elec. Furnace Bundles.	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-38.00
Charging Box Cast	29.00-30.00
Heavy Breakable Cast.	30.00-31.00
Stove Plate	33.00-35.00
Malleable	40.00-41.00
Clean Auto Cast	35.00-37.00
No. 1 Wheels	38.00-39.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$31.00
No. 2 Heavy Melt. Steel	29.00
No. 1 Busheling	29.00
No. 1 Bundles	31.00
No. 2 Bundles	27.00
No. 3 Bundles	25.00
Machine Shop Turnings.	23.00
Mixed Borings, Turnings	21.00
Short Shovel Turnings.	23.50-24.00
Bar Crops and Plate	33.00-34.00
Punchings & Plate Scrap	33.00-34.00
Cut Structurals	33.00-34.00
Elec. Furnace Bundles.	32.00-32.50
Heavy Turnings	31.00
No. 1 Chemical Borings	29.00-30.00

Cast Iron Grades

No. 1 Cupola Cast	40.00-42.00
Charging Box Cast	39.00-40.00
Heavy Breakable Cast.	39.00
Unstripped Motor Blocks	37.50-38.00
Malleable	50.00-52.00
Clean Auto Cast	40.00-42.00
No. 1 Wheels	42.00-43.00

NEW YORK

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$25.00-26.00
No. 2 Heavy Melt. Steel	25.00-26.00
No. 1 Busheling	24.00-25.00
Nos. 1 & 2 Bundles	24.00
No. 3 Bundles	22.00-23.00
Machine Shop Turnings.	18.00-19.00
Mixed Borings, Turnings	18.00-19.00
Short Shovel Turnings.	20.00-21.00
Punchings & Plate Scrap	28.00-29.00
Cut Structurals	28.00-29.00
Elec. Furnace Bundles.	28.00
No. 1 Chemical Borings	23.00-24.00

Cast Iron Grades

No. 1 Cupola Cast	36.00-37.00
Charging Box Cast	36.00
Heavy Breakable	33.00-34.00
Unstripped Motor Blocks	33.00-34.00
Malleable	46.00-48.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$23.00
No. 2 Heavy Melt. Steel	23.00
Nos. 1 & 2 Bundles	23.00
No. 1 Busheling	21.00
Machine Shop Turnings.	17.00
Mixed Borings, Turnings	16.50
Short Shovel Turnings.	18.00
Bar Crops and Plate	27.00
Punchings & Plate Scrap	27.00
Chemical Borings	20.00

Cast Iron Grades

No. 1 Cupola Cast	38.00
Charging Box Cast	36.00
Heavy Breakable Cast.	38.00
Stove Plate	35.00
Unstripped Motor Blocks	30.00
Clean Auto Cast	40.00

CHICAGO

No. 1 Heavy Melt. Steel	$28.50-29.00
No. 2 Heavy Melt. Steel	28.50-29.00
Nos. 1 & 2 Bundles	28.50-29.00
No 3 Bundles	26.50-27.00
Machine Shop Turnings.	23.00-24.00
Mixed Borings, Turnings	23.00-24.00
Short Shovel Turnings.	25.00-26.00
Cast Iron Borings	24.00-25.00
Bar Crops and Plate	31.00-31.50
Cast Steel	31.00-31.50
Punchings	31.00-31.50
Elec. Furnace Bundles.	29.50-30.00
Heavy Turnings	28.00-28.50
Cut Structurals	30.50-31.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-40.00
Malleable	35.00-40.00
Clean Auto Cast	35.00-40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	29.50-30.00
Rails, Rerolling	33.50-34.50
Rails, Random Lengths	32.50-33.50
Rails, 3 ft. and under	36.50-37.50
Rails, 18 in. and under	37.50-38.50
Railroad Specialties	34.50-35.50
Angles, Splice Bars	34.50-35.50

ST. LOUIS

No. 1 Heavy Melt. Steel	$29.00-30.00
No. 2 Heavy Melt. Steel	26.50-27.50
Machine Shop Turnings	21.00-22.00
Short Shovel Turnings.	21.00-22.00

Cast Iron Grades (Fob shipping ponit)

No. 1 Cupola Cast	32.00-33.00
Charging Box Cast	30.00-31.00
Heavy Breakable Cast.	29.00-30.00
Stove Plate	29.00-32.00
Brake Shoes	29.00-31.00
Clean Auto Cast	32.00-33.00
No. 1 Wheels	34.00-35.00
Burnt Cast	27.00-28.00

Railroad Scrap

R.R. Malleable	40.00-42.00
Rails, Rerolling	30.00-33.00
Rails, Random Lengths	29.00-30.00
Rails, 3 ft and under	35.00-36.00
Uncut Tires	32.00-34.00
Angles, Splice Bars	34.00-35.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$27.00
No. 2 Heavy Melt. Steel	27.00
No. 1 Busheling	27.00
Nos. 1 & 2 Bundles	27.00
No. 3 Bundles	25.00
Long Turnings	22.00
Short Shovel Turnings.	24.00
Cast Iron Borings	23.00
Bar Crops and Plate	32.00-33.00
Punchings & Plate Scrap	36.00-37.00
Cut Structurals	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	36.00-37.00
Stove Plate	34.00-35.00
No. 1 Wheels	32.00-32.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.00
R.R. Malleable	37.50-38.00
Axles, Steel	33.00
Rails, Rerolling	36.00-37.00
Rails, Random Length.	30.00-31.00
Rails, 3 ft and under.	32.00-33.00
Angles and Splice Bars.	32.00-33.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$19.04
No. 2 Heavy Melt. Steel	*19.04
No. 1 Busheling	*19.04
Nos. 1 & 2 Bundles	*19.04
No. 3 Bundles	*17.04
Machine Shop Turnings.	*12.54
Bar Crops and Plate	18.00
Cast Steel	18.00
Alloy Free Turnings	8.00
Cut Structurals	20.00-20.50
Tin Can Bundles	17.00

Railroad Scrap

Axles	26.50
Rails, Random Lengths.	21.00
Uncut Tires	28.00

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Busheling	20.00
Nos. 1 & 2 Bundles	20.00
No. 3 Bundles	18.00
Machine Shop Turnings.	11.50
Mixed Borings, Turnings	11.50
Punchings & Plate Scrap	21.50
Cut Structurals	21.50

Cast Iron Grades

No. 1 Cupola Cast	27.50
Charging Box Cast	22.50
Heavy Breakable Cast.	21.50
Stove Plate	23.00
Unstripped Motor Blocks	21.50
Malleable	27.50
Brake Shoes	27.50
Clean Auto Cast	27.50
No. 1 Wheels	24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Railroad Malleable	27.50
Rails, Random Lengths	20.00
Angles and Splice Bars.	21.50

LOS ANGELES

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
Nos. 1 & 2 Bundles	19.50
Machine Shop Turnings.	14.50
Mixed Borings, Turnings	14.50
Punchings & Plate Scrap	27.50
Elec. Furnace Bundles.	27.00

Cast Iron Grades

No. 1 Cupola Cast	30.00

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FOUNDRIES

30-pound Keokuk Electro-Silvery Pigs for charging mechanically into the cupola. Easily broken into two or more pieces, handled by magnet and measured by weight. Regular or alloy analysis.

12½-pound Keokuk Electro-Silvery Piglets so uniform in weight that they may be charged into the cupola by count, eliminating weighing operations. Handle by magnet. Regular or alloy analysis.

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60-pound Keokuk Electro-Silvery Pigs for blocking the open hearth heat. For equal distribution of silicon and best temperature meltdown. Handle by magnet. Regular or alloy analysis.

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Sheets, Strip. . .

Consumer goods output still restricted by shortage of flat-rolled products

Sheet Prices, Page 154

Chicago — Some consumers of sheet and strip have such small stocks they are operating on a hand-to-mouth basis. Thus, any interruption to shipments from mills causes serious dislocation in production schedules. In some industries, however, consumers' demand for products has slumped appreciably and, if continued for long or accelerated, may result in lessened demand for sheets and strip. Very few cancellations or shipment hold-up instructions have reached mills yet. There are reports that such items as beverage coolers and freezing cabinets are suffering from resistance to high prices. So far as sheetmakers can see now, however, there will be no balance between supply and demand this year.

New York—While sheet production continues at a fast clip, most producers are convinced that it will take considerable time for output to catch up with demand, unless there is marked business recession in general. The actual margin between supply and demand is not as great as it was, due not only to sustained high production, but to a somewhat more cautious buying policy on the part of consumers; however, demand is still well in excess of supply. Producers are allocating their tonnages carefully, so as to not only better conserve as much as possible for the more urgent needs of their regular trade, but to stamp out as much as they can the gray market operations which have been and still are a source of embarrassment to the steel industry.

Pittsburgh—No let-up in pressure for early sheet or strip deliveries is indicated through third quarter at least. Automotive interests, electrical appliance manufacturers and other important industries have been tooled-up for record-breaking production for months, but are prevented from attaining their goals due to shortage of sheets and strip. As a result, some interests are holding up delivery on other steel products on which inventories are getting out of line in relation to projected production schedules. In particularly short supply are galvanized and electrical sheets. Stainless and alloy items appear to be the only exception to current active demand for flat rolled products. Third quarter quota distribution pattern is little changed from current period on basis of present projected production schedules. Despite substantial increase in production facilities and indicated uninterrupted output, producers predict tight supply situation in sheets and strip through most of this year.

Philadelphia — While consumers are moving a little more conservatively in sheets they are not quite so frantic for tonnage. Moreover, they have further modified their own programs to some extent and are keeping a closer eye on inventories generally. Inventories have become so unbalanced in various instances that occasionally a consumer finds that he has more sheet tonnage than immediately required.

Cincinnati — Pressure for position on third quarter schedules of sheet mills and the appeal for expanded allotments gave further proof that supply will not catch up with demand in the current year. An occasional soft spot, where production of civilian goods has created a glut, is more than offset by forced delay of proposed higher output in other lines. Carryover into the third quarter will not be excessive, credit for this situation going to conservative commitments and steady rolling.

St. Louis—Sheet production in this district remains at 40 per cent of capacity as a result of a strike at Granite City Steel Co. Deliveries are now nearly 11 months late. Repeated shutdowns at that mill, however, have brought no order cancellations. Demand is unabated and customer pressure for the company to open its 1947 books has been great. Books on hot-rolled sheets for the third quarter are to be opend following settlement of the strike. Tonnage will continue to be allocated to users. A new cold rolling mill is due for completion in October and books for cold sheets are expected to open two or three months thereafter.

Ferroalloys . . .

Ferroalloy Prices, Page 157

Seattle — A. L. Collette, consultant for American Chrome & Magnesium Industries Inc., New York, has announced plans for operating the government-owned ferrosilicon plant at Rock Island, Columbia river, and also the magnesium pilot plant at Spokane, Wash.

• MACWHYTE does

• EXPERIMENTAL WIRE PATENTING TREATMENTS
• INHERENT GRAIN SIZE TESTING
• STRESS RELIEVING
• SPHEROIDIZING

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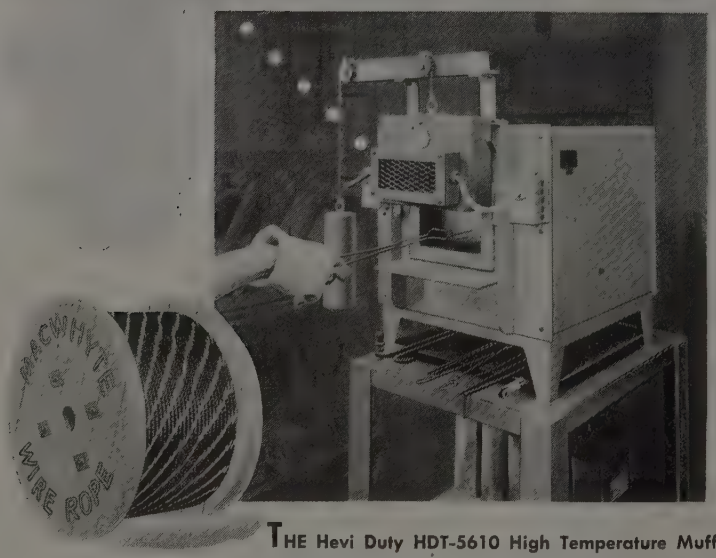

THE Hevi Duty HDT-5610 High Temperature Muffle Furnace, installed at MacWhyte Company, Wire Rope Manufacturers, at Kenosha, Wisconsin, in August 1940, is still operating on the original set of Alloy 10 elements. It is used at temperatures from 1700° to 2250° F from four to six days each week for as much as ten hours a day.

Hevi Duty Laboratory Furnaces with either chrome nickel or Alloy 10 elements are standard in most laboratories. There is a type and size for your particular research and analytical work — write for bulletins — today.

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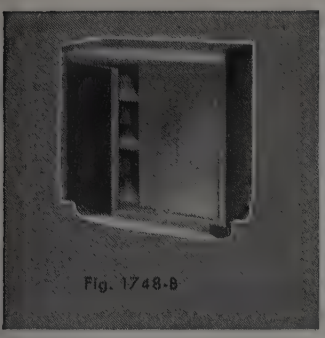
Fig. 1748-B

Fig. 1334

Fig. 2197

Fig. 1249

HALLOWELL

SHOP EQUIPMENT OF STEEL

. . . designed for comfort and utility

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Fig. 1855-A

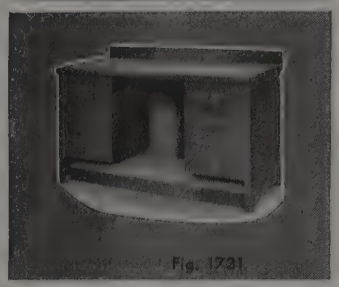
Fig. 1731

and the most exacting requirements of shop and factory can be filled easily with "Hallowell" Shop Equipment of Steel. It comprises: Stools, chairs, work-benches, foremen's desks, tool cabinets, and trucks—in a wide variety of styles and sizes—built of sturdy hard-wearing steel—a construction that has made "Hallowell" a *buy word*.

Write for your copy of the "Hallowell" Catalog. It's a handy reference when you order your shop equipment of Steel.

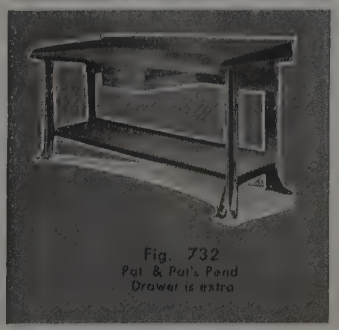
Fig. 732
Pat & Pat's Pend
Drawer is extra

"Unbrako" and "Hallowell" Products are sold entirely through Industrial Distributors.

Fig. 769

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Steel Bars. . .

Demand eases for 4-inch and larger bars . . . Smaller sizes remain tight

Bar Prices, Page 154

Philadelphia — Hot-rolled carbon bars are moving briskly. Particular pressure is still exerted for small rounds and flats and, while the situation in the medium and larger sizes is less stringent than earlier in the year, there apparently is a little tightening in the medium sizes, as compared with a few weeks ago, possibly due in part to the railroad program. Most producers have general quotas set up for the third quarter on a slightly larger scale, despite heavier allotments for railroad equipment. However, insofar as the small sizes of bars are concerned, there appears to be no improvement.

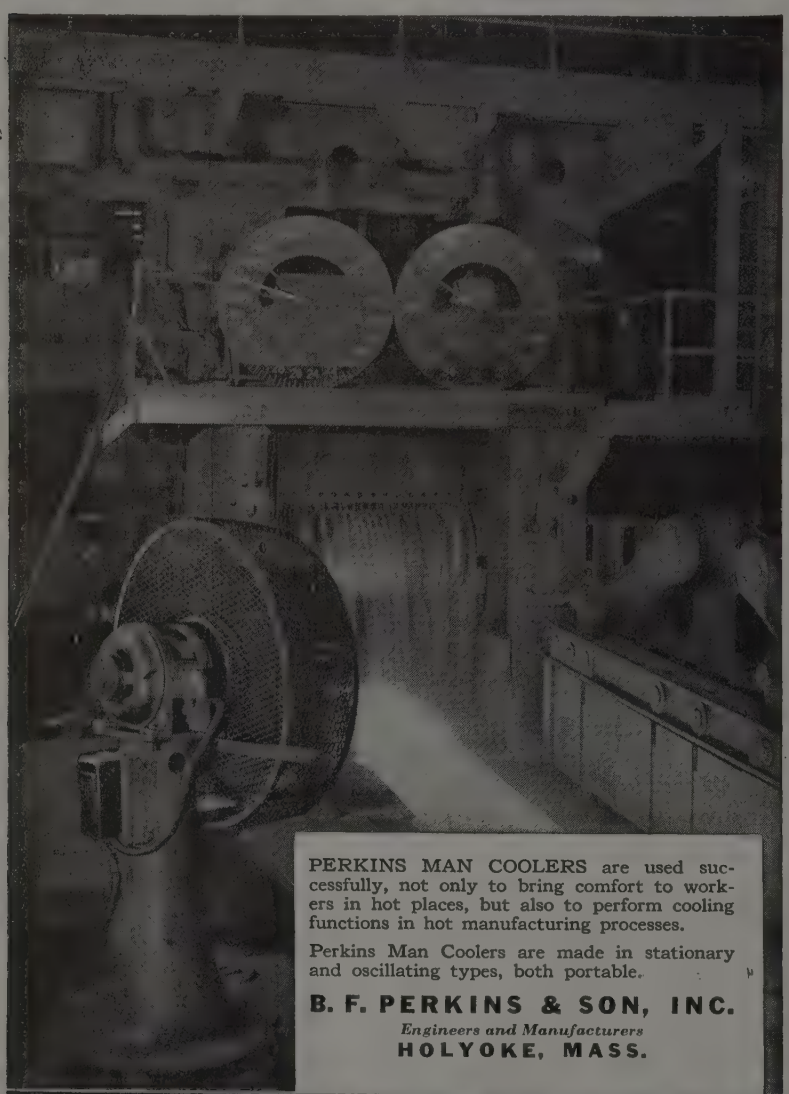
Cold-drawn bars are moving at a high sustained rate to bolt and nut makers, but shipments to the automobile industry could be stepped up considerably, were it not for the lag in certain other products which hamper production in that field. Alloy bars likewise are affected by this unbalanced situation in the automobile industry.

Pittsburgh—Cold finishers report improved mill deliveries of hot-rolled bars with result inventories are in better balance, which in turn permits more economical and higher production schedules. Demand for cold-drawn bars within the smaller size classifications has recorded little change, although some consumers are watching inventories more closely than six months ago. Demand-supply situation in hot-rolled alloy bars continues in good balance with most mills able to promise delivery within 4 to 6 weeks. Producers of carbon steel bars report a definite easing in demand for 4, 5 and 6-inch rounds from forgers, machine tool builders and jobbing trade, with deliveries now available within 4 to 6 weeks. However, no significant let-up in requirements for merchant bars in smaller size ranges has yet developed or is indicated until late third quarter at earliest. Augmented freight car construction program has accentuated the tight supply outlook for carbon bars. Distribution of bars in smaller sizes remains under strict allocation.

Boston—Further improvement in carbon bar supply for third quarter in a gradually lower range of sizes is apparent, notably in cold-finished with exception of most flats. In more sizes and grades supply is getting into balance with consumption which is below first quarter levels in scattered instances. This includes at least one forge plant, but not many screw machine shops. The latter have been supporting demand especially for cold-drawn. In carbon stock, most of the smaller sizes are still tight, and only in these are some producers allocating for third quarter. Part of the more conservative buying is due to unbalance in parts inventories compared with flat-rolled shortages. This is slowing new buying of bars, notably in the textile mill equipment end. With the possible exception of some alloys, there has been no test on prices and extras for bars or other finished steel products. Minor extras have been waived on alloys, and some tonnage of that grade is also tied in with carbon orders.

New York—Except for the large sizes, hot carbon bars are in active demand. In fact, the outlook over the next three months or so appears somewhat stronger than it did earlier this year. Medium sized bars are not under as great pressure as the small specifications, but there is more than recently and producers generally have been unable to step up their third quarter quotas to the extent anticipated. Some quotas were fixed definitely for the entire period two or three weeks ago, but others were set up for only the first month or two of the third quarter and it is only now that the entire period is being taken into account in some of these cases that the greater tightness is being reflected. Cold-finished carbon bars are still in good demand, especially in the smaller sizes. However, the overall situation in cold-finished carbon is not as stringent as in hot carbon, and in the alloy grades deliveries are relatively easy.

Chicago—Barmakers freely admit that demand for large and medium-sized bars has weakened considerably from that of a few months ago, but pressure for the smaller sizes is holding exceedingly strong. In fact, most consumers would be pleased to accept increased quotas. Indications are that forgers have reasonably good inventories of steel and in some instances demand for their product has fallen off. Supply of all alloys, hot rolled as well as cold-drawn, is adequate to meet current demand.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MAN COOLERS
TRADE MARK REGISTERED UNITED STATES PATENT OFFICE

Steel Plate...

Plate Prices, Page 155

New York — Plate buyers are having continued difficulty in placing orders and many who have tonnage on the books at the mills complain that they are not receiving the plates on schedule. Judging from the present outlook this stringency is expected to continue into the summer, if not longer.

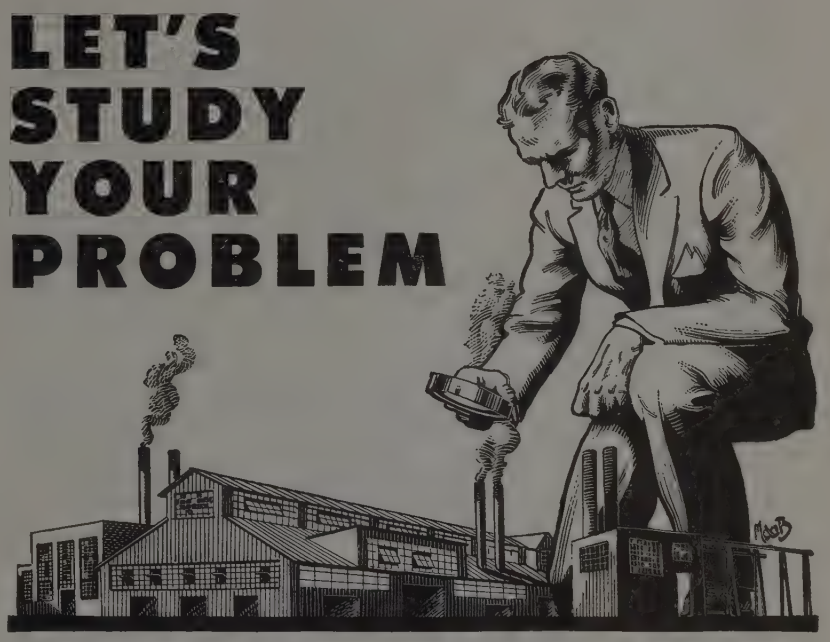
Some producers, by virtue of a highly selective policy in the acceptance of new work over recent months, have cut down arrearages to a certain extent, but with few exceptions they still have a month to six weeks work that is overdue. Earlier in the year some mills canceled a substantial portion of their backlogs, not wiping whole orders off the books necessarily but cutting down on portions of the orders. However, demand has been so pressing, especially for the light gage plates, that mills are still having difficulty in making headway.

Boston — Plate mill schedules are again being screened of old tonnage by some producers with reductions in allocations accompanied by selective acceptance of new volume. Some mills adopting this policy earlier are making inroads on delinquent tonnage, but heavier railroad requirements, large diameter pipe demand and miscellaneous needs preclude much improvement in supply to fabricators in third quarter. Small tank and weldment shops seek larger tonnages, but the former are especially hampered by inability to place lighter welding quality orders. Pressed heads, if dies are available, can be shipped in July, but larger diameter spun heads are sold well through this year. Paper mill machinery takes substantial volume of semi-fabricated plate tonnage, including weldments.

Philadelphia — Outlook in the plate market is for continued active demand. Tank fabricators generally are booked solidly over the remainder of the year; some of them well into next year. Structural fabricators also have substantial order backlogs. Railroad equipment requirements are expanding. Manufacturers of large line pipe are pressing for tonnage, and even shipbuilding in this district has been enlivened by plans for an ocean-going dredge for the United States Army engineers, Philadelphia, believed to be the largest ever contemplated. This dredge will require 6500 tons of steel, of which about 90 per cent will be plates.

Pittsburgh — Freight car construction is taking an increasing proportion of current plate output; one interest states output for this program now constitutes over 20 per cent of overall production. Heavy plate demand continues for tank and barge construction and miscellaneous repair programs. Mills have not been able to make substantial headway against heavy order backlogs despite relatively good production schedules to date this year. Fabricating shops report a steady volume of new jobs coming up for bids. However, some fabricators are turning down a considerable number of inquiries due to extended order backlogs and because the class of work in some instances would require an abnormal number of man hours in relation to value of the finished job.

Seattle — Plates continue in strong demand, but inventories are low and shops hesitate to bid on large projects.



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Wire. . .

Wire Prices, Page 155

Pittsburgh — No significant easing in wire rod supply is indicated until late next quarter at earliest, with result many nonintegrated wire producers will continue to operate well below capacity. Output of nails may be curtailed slightly next quarter, for present production schedules are above the 70,000-ton monthly goal established by federal housing officials and home construction has failed to come up to expectations. Merchant products in general, and particularly baling wire, bale ties and steel posts, are in substantial demand. Jobbers' stocks of nearly all merchant wire items are badly depleted, and on basis of present demand-production ratio there is little prospect this situation will be remedied until late this year at earliest. Among the manufacturers wire group, demand for high carbon spring wire and cold heading wire is particularly active.

Chicago — Wiremakers report demand for manufacturers grades is holding up well and there are almost no cancellations of tonnage despite the fact that consumers are attempting to hold down inventory. Estimates are that stocks approximate 60-days' consumption. Merchant products also are in heavy demand. At this time of year, fencing requirements taper off, but the reverse is true now and jobbers accept fencing items freely. Supply of bale ties, baling wire and barbed wire is far below requirements. One wire mill is promoting use of aluminum wire for bale ties and baling wire in an effort to alleviate the shortage of steel.

Tubular Goods. . .

Tubular Goods Prices, Page 155

Boston—Many tubular products, notably standard and most steel pipe, are as tight as flat-rolled with indications sheets may ease before pipe. Buying from distributors has slowed slightly, but backlogs are heavy. There are no cancellations or lower pressure for goods at mill levels, a few types of tubing and alloys excepted. Furniture tubing is off slightly. Pressing hardest for pipe are utilities, although shipments by some mills are in excess of prewar levels by substantial margins. Gas companies are centering activities on distribution lines by replacement of present pipe with larger diameters. Unable to get replacement pipe, some are increasing btu units in their gas to meet requirements. Pressure from pipe fabricating shops is about as heavy as that from utilities and most of them are over-committed on basis of current allocations and backlogs extend well into next year. Textile mill equipment builders in some instances underestimated welded tubing needs and are filling gaps with higher priced seamless. Copper-bearing transformer tubing users are after heavier tonnage for first quarter, next year. One development in the locomotive boiler tubing is logical; demand for replacements on steam units is active, but new use is being affected by the swing to diesels by many railroads. Alloy tubing is plentiful with mills seeking volume; one substantial purchase of alloy tubing has been made for an oil refinery, Texas.

Pittsburgh — Most pressing demand continues in the larger sized steel line pipe classifications. In most instances pro-

ducers are booked into 1949 for oil and natural gas pipe line requirements. Exceptionally heavy demand also is noted for oil well tubing, drill pipe and casing. Jobbers' inventories of standard pipe items remain well below stated requirements. Some headway is being made against order backlogs of seamless and electric welded carbon steel tubing, reflecting more conservative ordering on part of consumers fearful of over-extended inventories. Output of tubing is running about 5 to 7 per cent over fourth quarter 1946 level on basis of dollar valuation, largely reflecting price advance late last year. Demand for stainless steel tubing continues relatively heavy, particularly in the smaller size ranges. Acute shortage of cast iron pipe is holding up many municipal projects.

Seattle — Cast iron pipe agencies are severely handicapped by slow deliveries which now average 18 months to two years. There is a heavy potential demand for pipe but competing types are cutting into the cast iron field.

Structural Shapes. . .

Structural Shape Prices, Page 155

Boston — Up to 20 cents a pound and higher is being paid for small structural tonnages with a minimum of shop fabrication required in many cases. Shops are selling steel rather than fabrication frequently, yet the volume at these prices is surprisingly well sustained. A better supply balance in plain material is required to dent these price levels and this is not in immediate sight, notably in smaller sizes on which the bulk of volume is done. There is little structural material in warehouses. While two industrial projects take close to 1200 tons, one is being redesigned for prefabricated panel walls instead of masonry. Contracts have been distributed for numerous small state bridges, about 550 tons, mainly in Connecticut. One large buyer of fabricated structural steel for nationwide engineering and industrial projects asks for an escalator clause operating both ways, but does not always insist.

New York—Structural demand still lags, with orders light and inquiry scattered. High costs are the principal retarding factor and until there is at least some stabilization the situation is expected to continue this way. Public work is at the lowest point in months and only the more essential work in industrial and commercial construction is going ahead. As a recent added factor, a strike in the cement industry is holding up construction.

New York — April bookings amounted to 143,101 tons, slightly less than the revised total of 149,634 tons in March, according to the American Institute of Steel Construction. Estimated bookings for the first four months in 1947 amounted to 523,589 tons, an increase of 19 per cent over the average of 439,199 tons booked in the same months in the averaged five prewar years, 1936-1940. April shipments totaled 138,982 tons, a slight increase over March, and some 12 per cent greater than the averaged April shipments in the first prewar years.

Pittsburgh — An increasing number of instances are noted wherein bids received on a project have exceeded money appropriated for the job, notably municipal work. This situation of steadily rising construction costs has forced some projects to be indefinitely shelved and has resulted in the holding up of projected expansion programs of other jobs that had not yet reached the bidding stage. More active bidding on pending work is noted among fabricators, although most of them still have substantial order backlogs. Relatively good mill shipments in recent months have made it possible for fabricators to make some headway against accumulated bookings. On basis of present production schedules most structural mills hope to have carryover tonnage cleared up about the middle of next quarter.

Philadelphia — Although contracts are scattered and new inquiry is light, district fabricators have several months backlog on hand and are more concerned about obtaining steel than they are about the present lack of demand. An easier supply is indicated by possibly late this summer, but even so some fabricators believe that it will still fall short of requirements. Moreover, they anticipate better demand a little later in the year, unless there is a general business recession, and believe that conditions in the building field are gradually becoming more stabilized. Contributing also to the brighter outlook is lighter restriction on nonhousing construction.

Seattle — Many major projects, involving structural shapes are pending in this area. Fabricators are still acutely handicapped by shortages of steel and are unwilling to commit themselves beyond current supplies.

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Reinforcing Bars. . .

Reinforcing Bar Prices, Page 154

Pittsburgh—Reinforcing bar users are exerting considerable pressure on fabricators and suppliers to quote firm prices, but most interests hesitate taking such action because of uncertain operating costs, particularly on work that would not be completed until late this year or early 1948. Some industrial expansion programs, road work, highway bridges, and similar public jobs have been temporarily delayed because of present high construction costs and inability of customers to obtain firm cost estimates. Mill production allotments for concrete bars are not expected to register much change for the third quarter. Overall requirements have eased somewhat, but no let-up in pressure for deliveries is noted due to fact output still is substantially below capacity.

Boston — Reinforcing steel fabricators and distributors are fully committed on the tonnage of concrete bars in sight and some project tonnages are going begging. Inquiry is slightly heavier and in excess of supply, notably in the smaller sizes. Largest tonnage is out in Connecticut; highways in that state take 835 tons of mesh and a New Britain hospital, approximately 1200 tons. American Steel & Wire Co. booked 350 tons, mesh, North Haven-Wallingford highway section.

Chicago — Reinforcing steel activity consists mostly of a multitude of small jobs involving only a few tons each but aggregating a sizable tonnage. Large projects fail to attract much attention from mills or suppliers. Consumers are seeking unsuccessfully firm quotations. Until there is more assurance from mills on prices, business probably will continue to be written on the basis of price at time of delivery.

Seattle — A large volume of small tonnages of reinforcing bars, mainly for public works and emergency jobs, is being placed by mills here. Consequently, order backlogs are not being reduced materially. The situation enables producers to decline undesirable business but efforts are being made to accommodate regular customers. Numerous large projects are still under consideration due to unexpectedly high quotations.

Rails, Cars . . .

Track Material Prices, Page 155

New York — While full returns as yet have not been reported, it is believed that domestic freight car buying in May was off substantially from the 11,331 units placed in April, and under the average of the year to date. Recent orders have been light with new inquiry spotty. Robert B. McColl, president, American Locomotive Co., New York, last week predicted large scale export buying of diesel-electric locomotives in the next two years.

Tin Plate. . .

Tin Plate Prices, Page 155

Chicago — Tin plate makers continue to be pressed by customers for faster shipments and increased quotas for tin plate, despite the fact that food packs this coming season may be smaller than in recent years. Contributing to this belief are unfavorable growing weather and fact that large inventories have been carried over. High costs of production and declining retail prices also play a part. Experts feel that tin plate production will be adequate to meet demand for cans for food. Box car situation still is tight, but so far the railroads are supplying enough to keep plate production moving. Later on, however, the situation is expected to deteriorate.

Bolts, Nuts. . .

Bolt, Nut, Rivet Prices, Page 155

Cleveland—New prices on bolts have been announced by at least one non-local interest and many producers in the area are currently refiguring schedules to compensate for higher labor costs and revisions in extras, including cold-heading. Overall effect of the changes, according to the trade, will be negligible. Prices of the smaller sizes, still in short supply, generally will be increased to eliminate inequities in the price structure; price of some will be reduced.

Flow of steel to producers is still far below demand, although a slight easing in pressure from fastener users has been noted, with some steel products, notably sheets and structurals, proving more of a bottleneck than bolts, nuts and rivets.

Warehouse. . .

Warehouse Prices, Page 157

Pittsburgh — All steel distributors in this district have reverted to former practice of applying a uniform warehouse price spread to mill base price, plus extras, for hot and cold-rolled sheets. Despite exceptionally large finished steel output since first of year, the record peacetime demand for nearly all steel products has prevented steel distributors from augmenting inventories. However, on basis of present mill delivery promises some distributors hope to be on a current ordering basis with the mills by end of next quarter. Distributors' inventories of merchant wire and pipe items, small size bars, plates, wide flange beams and lighter gage sheet and strip are badly depleted. Some improvement in stocks of tubing, large carbon rounds, alloys and cold-finished bar items is noted.

Philadelphia — Some leading jobbers here claim that May business was down somewhat from the preceding month, which in one case at least was the most active in the company's history. However, soft steel flats and rounds, high-carbon plates suitable for machining, and sheets are in strong demand, with sales volume limited by the tonnage of incoming shipments.

Cincinnati — Warehouse business in this district is spotty, some interests reporting inquiries heavier than ever, whereas others sense a duller market. Jobbers are in the process of revising hot-rolled sheet prices, probably to parallel changes made in certain other districts which range from a cut of 5 cents per hundred pounds for 16 gage to 15 cents for 7 gage. Lack of improvement in mill shipments is holding down sales volume and causing unbalanced stocks.

St. Louis — Demand for warehouse steel continues strong with shipments from mills far under the expected level. Mills hold out hope of some early im-

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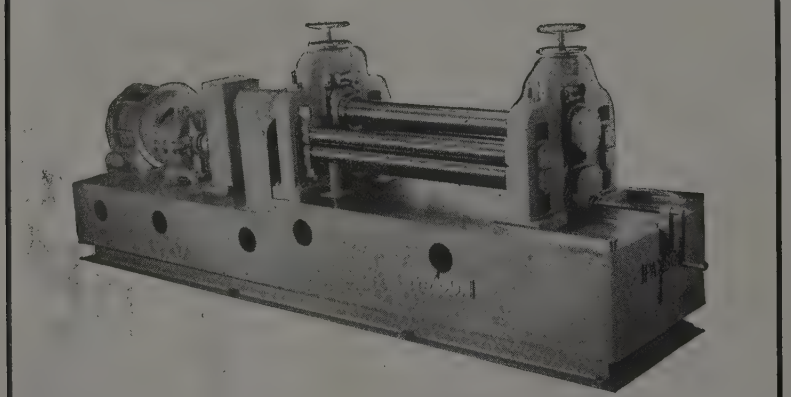

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provement in large sections of structurals and large bars, but there is no prospect for better tonnage in small items. Demand for smaller sections is especially high. So far a local decline in commercial construction work has not been felt by warehouses. They are not, however, besieged with requests to take mill-size orders as they once were, except in light sheets and ¼-inch and 3/16-inch plates. Demand for these is unrelenting from manufacturing plants, sheet metal shops and boiler makers, etc.

Los Angeles — A definite downtrend in steel warehouse business was unmistakable here last week. There has been wide cancellation of mill orders aimed at cutting high inventories. In most instances, however, these cancellations have been made too late. Stocks are now at an all-time high. While sheets and some lighter bar sections are currently short, this conditions can change rapidly because of stepped-up mill production and this has led buyers to hesitate in ordering of scarce material.

Steel fabricators in this area also have swollen inventories and are cautious in buying except for immediate need. The former system of ordering on a "soon as possible" basis has been replaced by one best described as an "order when can use."

Seattle — Wholesale jobbers report a volume of business exceeding that of a year ago. All out-of-stock items are in steady demand. Stocks are badly broken and unusually low. Sheets, nails and reinforcing bars are extremely scarce and little relief is anticipated prior to the fourth quarter.

Pig Iron. . .

Foundry operations continue hampered by shortages of pig iron and coke

Pig Iron Prices, Page 156

Chicago — Foundries are finding both pig iron and coke tight and the two combined are the controlling influence on castings production. Optimism is growing that a coal strike July 1 will be averted and that continuation of mining will alleviate the coke shortage. Foundry operators also are encouraged over the growing supply of steelmaking scrap, for they feel this will sooner or later enable steel plants to increase scrap consumption and thereby to make more pig iron available for merchant distribution. A third favorable factor is that backlogs of castings have shrunk, demand having fallen considerably in recent weeks.

Inland Steel Co. a week ago reumed its No. 1 blast furnace and again is producing merchant iron. In this action it restored its iron production to the level prior to the strike. Currently, 38 of the district's 41 blast furnaces are active.

Boston — Foundry melters are more exacting as to silicon analysis and are expected to become more so starting next month when the price advances sharply to $45 for Everett iron. June brings to an end lower prices for New England consumers. From a price angle, Buffalo and Pennsylvania iron becomes competitive, although the tonnage available for shipment to this area will be limited for some time. This may be a factor be-

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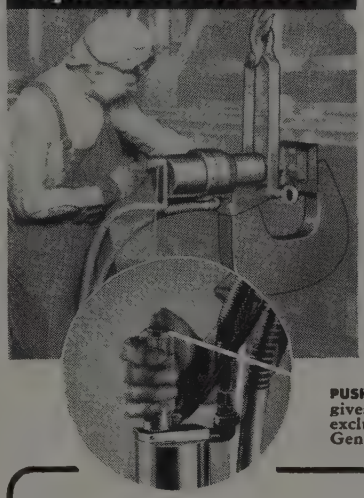

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fore the end of the year. Delivered Boston, Buffalo price for No. 2 foundry will be $39.48 on an f.o.b. furnace basis and Pennsylvania $39.32; small tonnage of southern iron is delivered on a Buffalo base. Pressure for tonnage has eased slightly; not only are melters tightening on specifications, but users of castings under subcontracts are also more exacting. To meet malleable requirements, Mystic furnace is scheduling that grade for production about one week each month.

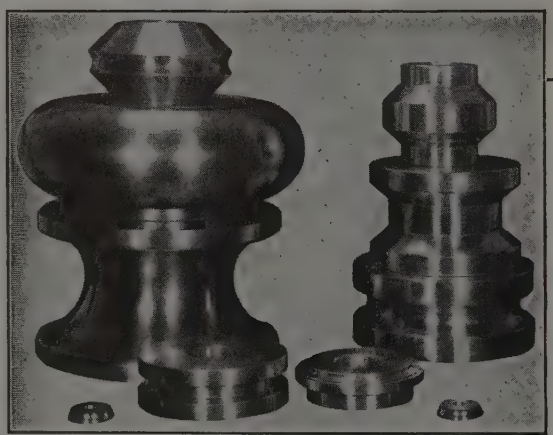
Pittsburgh — Most gray iron foundries do not expect merchant pig iron supply to be in balance with demand for months to come, reflecting continued shortage of cast scrap and fact output of "captive" merchant iron furnaces is diverted in a substantial degree to basic grades with remainder largely absorbed within a short radius of producing points. Lone merchant pig iron producer here is meeting but 60 per cent of stated monthly requirements, with result nearly all consumers are operating well below capacity. Part of this deficiency is attributed to swollen requirements due to pent-up demands accumulating during the war period; plus fact that shipments of merchant iron here from outside districts have been all but stopped, and because of the somewhat lower furnace output due to poor quality coke and scarcity of high iron content ores. With elimination of federal housing directive tonnage for bulk of the industry, distribution of pig iron has been on a more equitable basis in recent months. About one-third of merchant pig iron output is channeled into the housing program, in contrast to an average of about 45 per cent earlier this year.

Steel casting producers are reviewing production costs in light of recent wage advances and serious consideration is being given to advancing prices 5 to 15 per cent sometime next month.

Philadelphia — June pig iron quotas for the housing program appear to be about on the same level as for May. However, the outlook for consumers generally is a little more promising, because of heavier production and a freer flow of scrap. Most consumers fared a little better last month than they did in April. However, demand still exceeds supply.

Cincinnati—Demand for pig iron continues insistent, as furnace representatives contend tonnage being shipped into the district has maintained a steady volume. Some foundries have dug deeply into backlogs of castings orders, however, and new ordering is less active than formerly. By-product foundry coke is tight, but the scarcity has not caused a cut in the melt.

St. Louis — Pig production here remains at 500 tons daily, as against the normal 1000 tons, with one of Koppers United's two furnaces down for relining. It is scheduled to resume around June 1. Inability of outside furnaces to increase allocations here has resulted in an unusually severe shortage the last two months. Koppers has been alternating its one operating furnace between basic and foundry iron to meet the district's needs on a percentage basis. Partial shutdown of Granite City Steel Co., which takes its metal hot from Koppers, has alleviated the shortage somewhat.



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Scrap. . .

Firmer price undertone developing, but buying pressure is absent

Scrap Prices, Page 160

Philadelphia—Scrap demand is strong with prices turning higher. With few exceptions, all grades advanced last week. No. 1 heavy melting steel sold at $31, delivered. Machine shop turnings stiffened to a flat $23 and mixed borings and turnings to $21. Low phos scrap was generally higher, reflecting in part purchases by the leading Trenton, N. J., consumer who recently went back into production after having been closed down by a strike for more than three weeks. Bar crops and plate and similar grades were quoted $33 to $34. No. 1 cupola cast was higher at $40 to $42, delivered. Heavy breakable cast sold at $39, an increase of $2, with apparently no more available at the new figure.

Pittsburgh—Steelmaking scrap prices appear stronger on basis of sales in surrounding districts. Some trade authorities contend the next substantial mill purchase of open-hearth grades will be above $30. Bulk of old higher-priced orders have been shipped. However, most mills remain out of the market for dealer scrap and in one instance shipments on $30 orders have been held up. Steel producers contend that scrap shipments from customers continue to represent a substantial portion of purchased scrap requirements, with the result that inventories have been more than sustained in recent weeks. There is no pressure to buy scrap in the open market despite near-capacity steel operations. One theory, in addition to the above factor, for limited mill ordering of dealer scrap is that steel producers do not intend to have substantial tonnages of high-priced orders outstanding in event a prolonged coal strike should develop.

Some improvement also is noted in the supply of railroad and cast scrap items. Late last week, Baltimore & Ohio Railroad called for telegraphic bids on an additional 1000 tons of heavy melting steel scrap to its current list.

New York — Activity in the scrap market increased last week with brokers' buying prices generally higher. While most eastern mills are buying melting steel and certain other open-hearth grades on a differential basis, the Pittsburgh mills are still taking tonnage without too much regard to these differentials. Brokers are paying $25 to $26 for No. 1 and No. 2 heavy melting steel, $18 to $19 for machine shop turnings, and $20 to $21 for punchings and plate scrap. Cast grades are generally higher with brokers paying $36 to $37 for No. 1 cupola cast.

Boston — With expiration of old contracts, next new buying will determine the stability of the $23.25, shipping point, price for heavy melting steel scrap. At $30, delivered Pittsburgh, slight further reaction might follow to around $21. While collector supply of scrap has picked up, no heavy tonnage is emanating from other sources; industrial scrap production is off slightly and automobile dismantling is restricted. Shipbreaking has little direct effect in this territory. Cast scrap activity is slack.

Buffalo — Despite absence of new tonnage orders, steadier tendencies dom-

inated the scrap trade last week. Dealers continued to ship against old orders and feel that mills will seek additional tonnages at the prevailing range of $29-$31 for No. 2 heavy melting and bundles. The two top mills in the area report that current receipts are only equal to consumption. Boat receipts are expected to augment stocks within the week.

Cleveland — Undertone of the scrap market here remained firm last week with No. 1 heavy melting steel quoted $30.50 to $31. Isolated sales of premium grades were reported, however, at slightly higher levels. Flow of material to mills continued steady and at about the same rate as consumption. If steelmaking operations hold at the present high rate, mills are expected to enter the market more actively within the next two weeks. Foundries also are better supplied with scrap but they are cautious in placing new orders at present price levels. While incoming shipments are adequate to support current operations, they are not large enough to add greatly to reserve stocks.

Detroit — Market on open-hearth grades of scrap has turned bullish, higher by $1.50, to $26.00-$26.50. The upward surge is primarily the result of local brokers being oversold for the account of the main buyer. Whether the mill will pay the higher price remains to be established; unofficially, the buyer has indicated in the negative. Electric furnace material is higher by $1 per ton. Cast grades are quoted unchanged, but are sentimentally a shade weaker.

Cincinnati—Iron and steel scrap prices are unchanged, although there has been an absence of buying. Tonnage coming out since fulfillment of the higher-priced contracts has shrunken, and some interests contend the supply may be found inadequate to meet present melting demands. Belief that mills will soon enter the market for tonnage purchases is giving a firm undertone to quotations.

Chicago — Scrap prices are holding steady despite the fact that buying by steel mills continues light. Increase in quantity of open-hearth grade tends to hold the price level at the point to which it dropped recently.

St. Louis — Scrap prices continue to ease in this district in response to mounting reserves at mills and foundries. Mill inventories average at least 60 days and those of foundries range up to 75 days. A rush of shipments has hit this market the last three weeks as a result of $30 current prices and an anticipated further drop next month. That cleanup is believed over now, however, and shipments last week declined noticeably. Mills were largely out of the market last month and only returned in May as a result of slipping prices. Whether they stay in the market in June depends on prices to a greater extent than for many months. Most big melters now are in position to hold out until prices drop. Cast grades eased considerably last week, following a similar decline in melting steel the week before. Charging box cast, for example, is down $2 to $30-$31 and brake shoes to $29-$31. Three-foot rails eased $1 to $35-$36.

Seattle — Steel scrap is reaching the mills in steady volume, enabling some increase in inventories. The usual sources are shipping steadily while the ship breaking plants here, at Portland, Oreg., and Kalama, Wash., are getting into heavier production.

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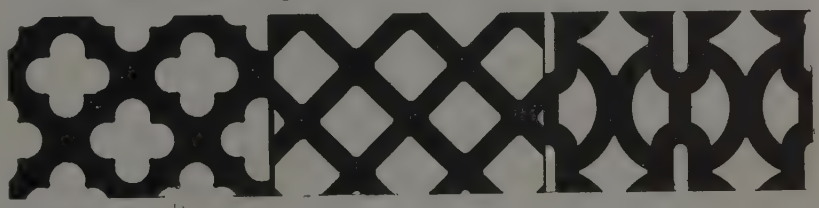

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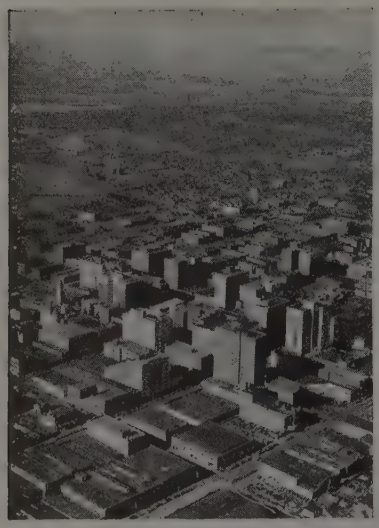

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Canada . . .

Toronto, Ont.—Primary iron and steel shapes made in Canadian steel mills during February amounted to 257,556 net tons, including 250,730 tons of carbon shapes and 6826 tons of alloy steel shapes, and compares with 267,511 tons, including 258,060 tons of carbon and 9451 tons of alloy steel shapes, in January; 234,863 tons, including 229,266 tons of carbon and 5597 tons of alloy steel shapes, in February, 1946.

During February, shipments of primary iron and steel shapes by Canadian producers totalled 266,059 net tons, including 158,198 tons of carbon and 7861 tons of alloy steel shapes, which compares with 261,114 tons of carbon steel and 7199 tons of alloy steel shapes shipped in January, and 219,993 tons of carbon and 4862 tons of alloy steel shapes shipped in February, 1946.

Shipments for the month under review included 24,330 tons of semi-finished steel shapes; 12,614 tons of structurals; 14,974 tons of plates; 17,087 tons of rails; 50,929 tons of hot-rolled bars; 12,541 tons of pipe and tubes; 14,860 tons of wire rods; 14,627 tons of black sheets; 6599 tons of galvanized sheets; 504 tons of tool steel, 5796 tons of castings and 29,063 tons of other shapes.

Of the shipments in February, 35,878 tons were delivered to railways and railway car shops; 10,199 tons to pressing, forming and stamping plants; 21,196 tons to merchant trade products; 22,946 tons to building construction; 16,006 tons to the containers industry; 11,301 tons to agricultural implement; 11,059 tons to the automotive industry; 13,206 tons to machinery plants; 2785 tons to shipbuilding; 5762 tons to mining, lumbering, etc.; 1992 tons to miscellaneous industries. Wholesalers and warehousing took 29,517 tons and exports 21,681 tons.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 156

Cleveland — Although foundries are still on a hand-to-mouth basis on deliveries of by-product coke and the area's leading producer reports inability to accumulate supplies in excess of demand, the product limiting output of the district's foundries is pig iron. Customers are receiving coke in limited quantities, the producer checking to make sure no more is delivered than can be used immediately.

Refractories. . .

Refractories Prices, Page 156

Pittsburgh — Exceptionally heavy demand makes it impossible for producers to make much progress against extended order backlogs, which range from six to eight months on special shapes, such as silica coke oven brick. However, standard items for open hearth maintenance, etc., are available within 8 to 10 weeks. Some sellers predict heavy demand for months to come for much overworked blast furnaces, open hearths and coke ovens. Expansion and replacement of older coke oven batteries also are expected to require a sizable additional tonnage of refractories later this year. Refractory brick output has held up very well in recent months.

Committee Pushes Probe On Steel Supply Situation

(*Concluded from Page 70*)

of last year. A Commerce Department official said the reason for the increase was domestic production of the pipe had caught up with demand and no export licenses were needed.

Just what voluntary corrective action the steel producers can take is uncertain. Crux of the matter is that demand for steel is in excess of producers' ability to supply fully. The mills point out that they make every effort to see that steel is shipped only to legitimate customers. However, it is impossible for them to keep track of shipments once they have been delivered to buyers so that should a legitimate buyer later dispose of a tonnage in the open market, there is no way the steel mill can prevent such sales, except deny the customer further shipments. Mills, generally, have adopted this latter policy where deliberate diversion of steel to the gray market is shown.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2200 tons, power plant, unit No. 4, Port Washington, Wis., to Worden-Allen Co., Milwaukee.

1475 tons, overpass, Scott & Bernard Sts., Houston, Tex., to American Bridge Co., Pittsburgh.

1100 tons, boiler supports, Monsanto Chemical Co., various locations, to American Bridge Co., Pittsburgh.

1000 tons, rehabilitation of blast furnace No. 1, Youngstown Sheet & Tube Co., Indiana Harbor, Ind., to Lackawanna Steel Construction Corp., Buffalo, through Arthur G. McKee & Co., Cleveland, general contractor.

785 tons, superstructure, bascule bridge, Hampton Harbor, N. H., to Phoenix Bridge Co., Phoenixville, Pa., direct bid.

470 tons, bridge, Sandstone, Minn., for state, to American Bridge Co., Pittsburgh.

265 tons, taconite plant, Pickands, Mather & Co., Aurora, Minn., to Worden-Allen Co., Milwaukee.

225 tons, Sturgeon river bridge, Alberta, Mich., to American Bridge Co., Pittsburgh.

210 tons, two state bridges, East Hartford, Conn., to Bethlehem Steel Co., Bethlehem, Pa.

125 tons, two state bridges, Fitchburg, Mass., to Phoenix Bridge Co., Phoenixville, Pa.

100 tons, repairs, Newfield bridge, New Hampshire, to Phoenix Bridge Co., Phoenixville, Pa.

100 tons, bridge, Brattleboro, Vt., Phoenix Bridge Co., Phoenixville, Pa.

Unstated, two high pressure dam gates for reclamation projects, to Willamette Iron & Steel Co., Portland, Oreg., $27,000.

STRUCTURAL STEEL PENDING

2360 tons, Market St. subway extension, Philadelphia Department of City Transit, bids June 18; 320 tons of deformed bars also will be required.

1900 tons, Lewiston bridge, Idaho, for Bureau of Highway; bids May 23.

1700 tons, Sault Ste. Marie bridge, Michigan, for state; bids extended from June 10 to June 24.

1500 tons, hospital, Our Lady of Lourdes, Cam-

den, N. J.; opening of bids postponed from May 27 to June 17.

1320 tons, Missouri river bridge, Decatur, Nebr.; bids June 16.

1200 tons or more, Lewiston river state bridge, Lewiston, Idaho; Paul Jarvis Co., Seattle, low $955,167.

1000 tons, news publishing building, Indianapolis; bids May 20.

600 tons, Corson Inlet bridge, Strathmere, N. J.; Brann & Stuart, Philadelphia, low on general contract.

500 tons, fine arts building, University of Kentucky, Lexington, Ky.; bids May 29.

850 tons, field house, Father Flanagan's Boys Home, Boys Town, Nebr.

530 tons, highway construction, Iowa, for state; Booth & Olson Inc., Sioux City, Iowa, low on general contract.

475 tons, heat exchanger and vessel structure, Carter Oil Co., Billings, Mont.

350 tons, state bridge, Connecticut river, Greenfield-Montague, Mass.; bids June 17, Department of Public Works, Boston.

275 tons, state highway span, Cowlitz county, Washington; J. J. Badraum, Seattle, low $146,139.

200 tons, building, Elmer E. Mills Corp., Chicago; bids May 30.

175 tons, state highway bridge, Clark county, Washington; bids to Olympia, Wash., June 16.

170 tons, municipal bridge over Cobbs creek, Philadelphia, Kaufman Construction Co., that city, low on general contract.

160 tons, state bridge, Wyoming county, Pennsylvania, bids June 6.

150 tons, club house, St. Anthony's club, Wilmington, Del.; bids closed.

150 tons, repairs to Ocean City-Longport bridge, New Jersey; Ole Hansen & Son Inc., Pleasantville, N. J., low on general contract.

150 tons, prefabricated galvanized steel towers; bids to Bonneville Power Administration, Portland, Oreg., June 5.

150 tons or more, Monsanto Chemical Co. plant, Seattle; bids soon.

140 tons, buildings, Drake University, Des Moines; A. H. Neuman Co., Des Moines, low on general contract; bids May 20.

125 tons, erection only, three state bridges, Gardiner, Owls Head and Sangerville, Me.; bids June 4, State Highway Commission, Augusta, Me.

116 tons, housing project, Moline, Ill.; postponed pending revisions.

100 tons, two-span steel stringer bridge, Pittsfield, Mass.; bids June 3, Boston.

Unstated, steel truss span, Trask river, Oregon; V. A. Dare Construction Co., Portland, Oreg., low $101,120.

Unstated, state bridge, Polk county, Oregon; V. A. Dare Construction Co., Portland, Oreg., low $56,760.

PLATES . . .

PLATES PLACED

1500 tons, rehabilitation of blast furnace No. 1, Youngstown Sheet & Tube Co., Indiana Harbor, Ind., to William B. Pollock Co., Youngstown, O., through Arthur G. McKee & Co., Cleveland, general contractor.

200 tons or more, 200-foot, 1800-horsepower diesel steel ferry, for Columbia river service, state highway commission to Albina Engine & Machine Works, Portland, Oreg., $458,323.

REINFORCING BARS . . .

REINFORCING BARS PLACED

350 tons, highway project, Wilbur Cross parkway, North Haven-Wallingford, Conn., to American Steel & Wire Co., New York; New Haven Roads Construction Co., New Haven, general contractor.

250 tons, Black Hawk generating station, unit No. 4, Wisconsin Power & Light Co., Beloit, Wis., to Ceco Steel Products Corp., Omaha, Nebr.

227 tons, sewage plant, Marshfield, Wis., to Ceco Steel Products Corp., Omaha, Nebr.; Thompson-Abbott Construction Co., Marshfield, Wis., contractor.

100 tons, bridge and approaches, Chesterfield, Mass.; bids June 10, Department of Public Works, Boston.

REINFORCING BARS PENDING

2000 tons, residence buildings, Indiana University, Bloomington, Ind.; bids May 26.

1200 tons, hospital, New Britain, Conn.

1000 tons, various irrigation projects, Bureau of Reclamation, Denver; bids May 28.

900 tons, Columbia basin project, Bureau of Reclamation, Denver, delivery to Adrian, Wash.; bids May 28.

550 tons, grain elevator at Tacoma, Wash., to Northwest Steel Rolling Mills Inc., Seattle.

227 tons, sewage plant, Marshfield, Wis.; general contract to Thompson-Abbott Construction Co., Marshfield, Wis.; bids Apr. 17.

215 tons, highway project, Farmington, Conn.; bids June 9, state highway commissioner, Hartford.

200 tons, rotogravure plant, R. R. Donnelley-Crawfordsville Co., Chicago; bids June 2.

175 tons, factory building, Furst-McNess Co., Freeport, Ill.; general contract to Henry Pfutzenreuter & Sons, Chicago; bids Apr. 21.

125 tons, Boise, Idaho, project, Bureau of Reclamation, Denver, delivery to Jenness, Idaho; bids May 28.

110 tons, box girder bridge, Yakima county, Washington; bids to county commissioners, June 3; readvertised.

110 tons, highway project, Shelton-Derby bypass, Connecticut; bids June 9, Hartford.

Unstated tonnage, rehabilitation of blast furnace No. 1, Youngstown Sheet & Tube Co., Indiana Harbor, Ind.; Arthur G. McKee & Co., Cleveland, general contractor.

Unstated, Upjohn Co., drug dispensary and office, Portland, Oreg.; Austin Co., Cleveland, general contractor.

Unstated, $300,000 Armour & Co., plant, Portland, Oreg.; Ross B. Hammond Co., general contractor.

Unstated, nurses home, Swedish Covenant hospital, Chicago; bids June 5.

Unstated, rotogravure plant, R. R. Donnelley-Crawfordsville Co. Inc., Chicago; bids June 2.

PIPE . . .

CAST IRON PIPE PLACED

195 tons, 6 to 12-inch, Melrose, Mass., to Warren Pipe & Foundry Co., Everett, Mass.

130 tons, 16-inch, Old Orchard Beach, Me., to R. D. Wood Co., Florence, N. J.

100 tons, 6 to 10-inch, Watertown, Mass., to Warren Pipe & Foundry Co., Everett, Mass.

100 tons, 6 to 10-inch, New Bedford, Mass., to R. D. Wood Co., Florence, N. J.

100 tons, 6 to 12-inch, West Springfield, Mass., to R. D. Wood Co., Florence, N. J.

CAST IRON PIPE PENDING

2000 tons, 6 to 16-inch cast iron pipe, $800,000 water system project, Westport, Wash., including filter plant, sheet steel piling, elevated steel tank, bids June 14; alternate pipe bids specified; Willis T. Batchelder, Seattle, engineer.

Unstated, 15,000 feet, 6, 8 and 1-inch cast iron pipe; also hydrants, meters, etc.; bids to John Jacobi, town clerk, Oreville, Wash., June 16.

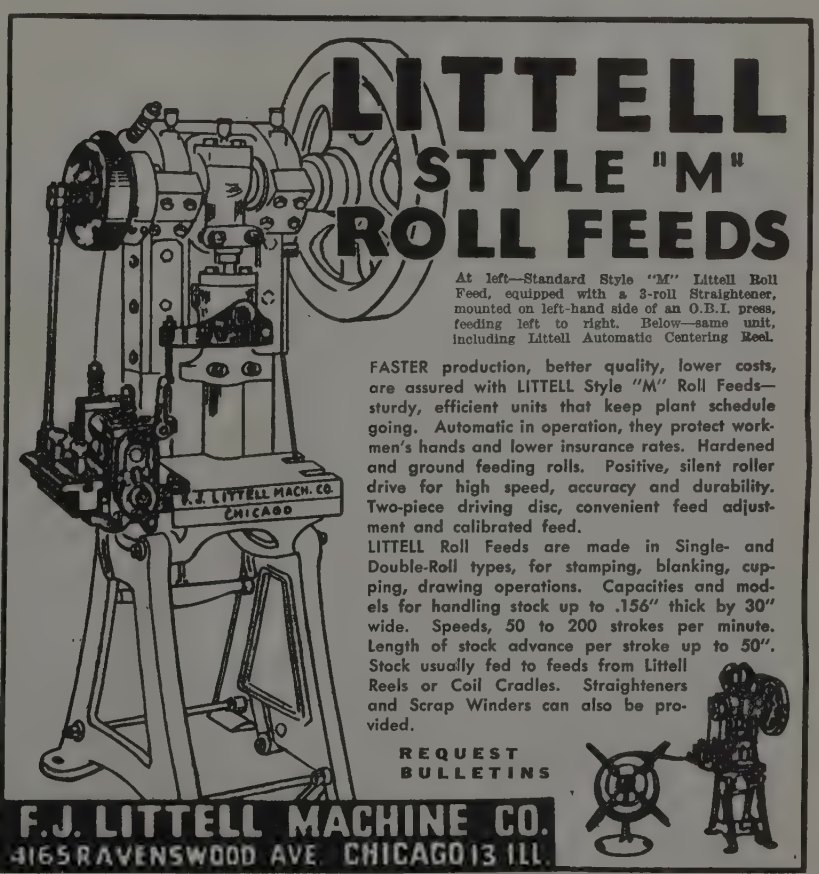
RAILS, CARS . . .

LOCOMOTIVES PLACED

Central Railroad of Brazil, twelve 1500-horsepower diesel-electric locomotives, to American Locomotive Co., New York.

RAILROAD CARS PLACED

New York City Board of Transportation, 150 subway cars, to American Car & Foundry Co., New York.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CONSTRUCTION AND ENTERPRISE

CALIFORNIA

LONG BEACH, CALIF.—Ford Motor Co., Henry Ford Ave., will construct a heating plant for its Lincoln-Mercury buildings at 5801 E. Slauson Ave. Cost is about $186,000.

LOS ANGELES—Keystone Engineering Co., 1444 S. San Pedro St., will build a 10,000 sq ft addition to its machine shop.

LOS ANGELES—Harman Pump Co., 1575 Compton Ave., Charles M. Peak, president, has received OHE approval for construction of an office and factory at 1110 E. 14th St.

LOS ANGELES—Paul-O-Cast Co., formerly M & M Foundry, 4835 Staunton Ave., will construct an 8500 sq ft plant at Loren & Todd Sts. Company makes cast iron soil pipe and fittings.

LOS ANGELES—H. Kramer & Co., 2460 Enterprise St., will build a 2-story warehouse and foundry, 1-story office and laboratory, storage tanks and a metals refining plant at 52nd and Woodlawn Aves. To cost over $55,000, the plant was designed by Arthur C. Munson, 108 W. 6th St.

REDWOOD CITY, CALIF.—Chemical Process Co., 58 Sutter St., San Francisco, has awarded a $65,000 contract for the second unit of its factory here to Wagner & Martinez, 181 S. Park St., San Francisco. Architect is Morgan Stedman, 180 University Ave., Palo Alto. Engineers are Hall & Pregnoff, 251 Kearney St., San Francisco.

RICHMOND, CALIF.—American Radiator & Standard Sanitary Corp., Critchett & Essex Sts., has awarded a $500,000 contract for a 2-story brass manufacturing plant to Empire Construction Co., 344 Harriet St., San Francisco.

SANTA CLARA, CALIF.—Owens Corning Fibre Glass Corp., 1500 Nicholas Bldg., Toledo, O., has had plans made by Austin Co., 16112 Euclid Ave., East Cleveland, O., for a 1 and 2-story factory here.

ILLINOIS

CHICAGO—Goodman Mfg. Co., 4834 S. Halsted St., has awarded a $350,000 contract for a machine shop and assembly building to Sumner S. Sollitt Co., 307 N. Michigan St.

NILES, ILL.—A. B. Dick Co., 720 W. Jackson Blvd., has awarded a $2 million contract to Austin Co., 510 N. Dearborn St., for a 1 and 2-story factory and office.

MASSACHUSETTS

BRIGHTON, MASS.—International Equipment Co. plans to construct a $120,000 factory for manufacture of medical equipment.

MICHIGAN

BRITTON, MICH.—Efficient Engineering Co., Detroit, is having plans prepared by Gould Engineering Co., Flint, for a $200,000 factory building.

DEARBORN, MICH.—Universal Products Co. Inc., 6455 Kingsley Ave., has awarded a $150,000 contract for two factory additions to O. W. Burke Co., 1932 Fisher Bldg., Detroit.

DETROIT—Steel Plate & Shape Corp. plans to build a $762,000 factory and office building.

DETROIT—Federal Industries Inc., 19720 W. Eight-Mile Rd., has been formed by Drew C. Mapeline with a capital of $250,000 to manufacture machined parts.

DETROIT—B & O Screw Products Co., 9370 Roselawn, has been formed by Joseph O'Brien with a capital of $150,000 to manufacture and sell automatic screw machine products.

DETROIT—Wayne Steel & Supply Corp., 4520 Maybury Grand, has been formed by Ida Kovinsky with capital of $200,000, to manufacture and process nuts, bolts, mill and factory supplies.

FRASER, MICH.—Detroit Development & Mfg. Co. suffered fire damages recently at its plastics plant here estimated at $150,000.

GRAND RAPIDS, MICH.—Pere Marquette Railway, Detroit, is preparing plans for construction of a $243,000 engine and repair shop. H. J. Bogardus is the company's chief engineer.

MUSKEGON, MICH.—Brunswick, Balke, Collender Co. will build a $100,000 addition to its dry kiln plant. Plans are by H. E. Beyster Corp., 2100 Industrial Bank Bldg., Detroit.

PORT AUSTIN, MICH.—Port Austin Level & Tool Mfg. Co. has been formed by John E. Upthegrove with a capital of $75,000 to manufacture tools.

RIVER ROUGE, MICH.—Sun Oil Co. has received OHE approval for its $397,000 project which includes construction of a warehouse, boiler room and dispatch building.

ROSEVILLE, MICH.—Elkin Tool & Mfg. Co., 29347 Gratiot Ave., has been formed by Hugo Leibold with a capital of $150,000 as a general manufacturing business.

ST. CLAIR SHORES, MICH.—Daniels Tool & Engineering Co., 16010 Harper Ave., Detroit, will build a factory and office here costing $150,000. Plans are by J. C. Stahl, 1115 Francis Palms Bldg., Detroit.

YPSILANTI, MICH.—Ford Motor Co. is taking figures on new boilers at its plant here. Architect is Albert Kahn Associated Architects & Engineers, Detroit.

NEW YORK

AMITYVILLE, N. Y.—Keller Dorian Corp., 350 5th Ave., New York, has cancelled its $263,000 project for a factory here.

OHIO

CLEVELAND—Sobol Machine Corp. has been incorporated by Bernard Sobol, 3190 E. 65th St., with a capital of $50,000.

CLEVELAND—Spo Inc., 7500 Grand Division, is completing construction of a $120,000 building for the manufacture of foundry equipment.

CLEVELAND—Bailey Meter Co., 1051 Ivanhoe Rd., will build a $161,000 addition for the manufacture of power plant controls and meters.

CLEVELAND—Jones & Laughlin Steel Corp., 3341 Jennings Rd., will spend $715,000 for an addition to and alterations of existing building to increase production of open hearth steel 10 per cent.

DEFIANCE, O.—Central Foundry Division, General Motors Corp., Detroit, will build a $1,900,000 gray iron castings foundry here.

TOLEDO, O.—Libbey-Glass Division, Owens-Illinois Glass Co., Ash St., has awarded a $175,000 contract for a 2-story factory at 1101 Buckeye St. to A. Bentley & Sons Co., 201 Belmont St.

WOOSTER, O.—Rolland Cox Drilling Corp. has been incorporated by Rolland Cox, 463 Beverly Rd., with a capitalization of $150,000.

PENNSYLVANIA

BRACKENRIDGE, PA.—Allegheny Ludlum Steel Co. plans to build a $119,000 addition to its steel slab building. Engineer is George Battacher, c/o owner.

EMLENTON, PA.—Quaker State Oil Refining Corp. has awarded a $105,000 contract to H. T. Osborne Co., 12th St., Franklin, Pa., for filter and compressor buildings.

LANSDOWNE, PA.—Hajoca Corp., 31st and Walnut Sts., Philadelphia, has awarded a $65,000 contract to Koedding Inc., 8 N. Union Ave., for an assembly plant and pipe warehouse. Architects are Colish & Etter, 117 S. 17th St., Philadelphia.

PHILADELPHIA—S. Twitchell Co., 225 Vine St., will build a $55,000 manufacturing, laboratory and storage building. Architect is Howard Carter Hill, 112 S. 16th St.

PHILADELPHIA—Ajax Electric Co., Frankford & Delaware Aves., has awarded a $110,000 contract to Haverstick Borthwick Co., Schaff Bldg., for a 1 and 2-story building. Architect is Robert C. Martin, 8120 Cadwallader Rd.

WATSONTOWN, PA.—Philco Corp. will build a $115,000 addition to the plant of its Watsontown Cabinet Division.

YORK, PA.—Dentist Supply Co., Grantley Rd. and College Ave., will build a $226,000 plant addition.

YORK, PA.—New York Wire Cloth Co., 441 E. Market St., will build a $107,000 plant addition.

TEXAS

DALLAS, TEX.—Texlite Inc., 2900 Factory St., will build a $55,000 2-story plant. Architect is Grayson Gill, Great National Life Bldg.

HOUSTON, TEX.—Magnolia Petroleum Co., 1009 Fannin St., will spend $10 million on units for manufacturing lubricating oils.

HOUSTON, TEX.—Mission Mfg. Co., Humble Rd., plans to spend $700,000 on a plant, warehouse and storage building.

HOUSTON, TEX.—Reed Roller Bit Co., Mack St., will build a $300,000 plant.

HOUSTON, TEX.—Westinghouse Electric Co., 1314 Texas Ave., will soon let a $703,000 contract for a manufacturing plant and repair shop.

HOUSTON, TEX.—Houston Power & Equipment Co., 4600 Navigation Blvd., will construct a $65,000 shop building. Architect is Ernest L. Shult, 5009 Fannin St.

HOUSTON, TEX.—American Smelting & Refining Co., 9000 Market St., will soon let contracts totaling $215,000 for smelting plant and auxiliary equipment in connection with the project.

LAREDO, TEX.—Texas-Mexican Railway is asking for bids on a 1-story warehouse. Architect is Fred Jones, Alamo National Bldg., San Antonio.

TEXAS CITY, TEX.—Union Carbide & Carbon Co. will reconstruct its plant at a cost of $250,000.

TEXAS CITY, TEX.—Republic Oil & Refinery Co. will spend $1,800,000 reconstructing and improving its cracking plant, oil refinery, pipelines to adjacent areas, docks and storage facilities here.

WASHINGTON

SEATTLE—Standard Steel Fabricating Co. Inc., 1640 W. Hanford St., has abandoned its plans for plant expansion on Harbor Island.

SEATTLE—Pacific Metal Co. has OHE approval for proposed $100,000 warehouse at 4140 First Ave. S. H. S. Wright Co. has the general contract.

YAKIMA, WASH.—John Deere-Lindeman Co. has called bids for a proposed $75,000 forge shop, 14,000 sq ft in area.

CANADA

TILLSONBURG, ONT.—Maple Leaf Harvest Tool Co., W. H. Hill, manager, plans to build a $500,000 machine shop, forge and tool room and office.

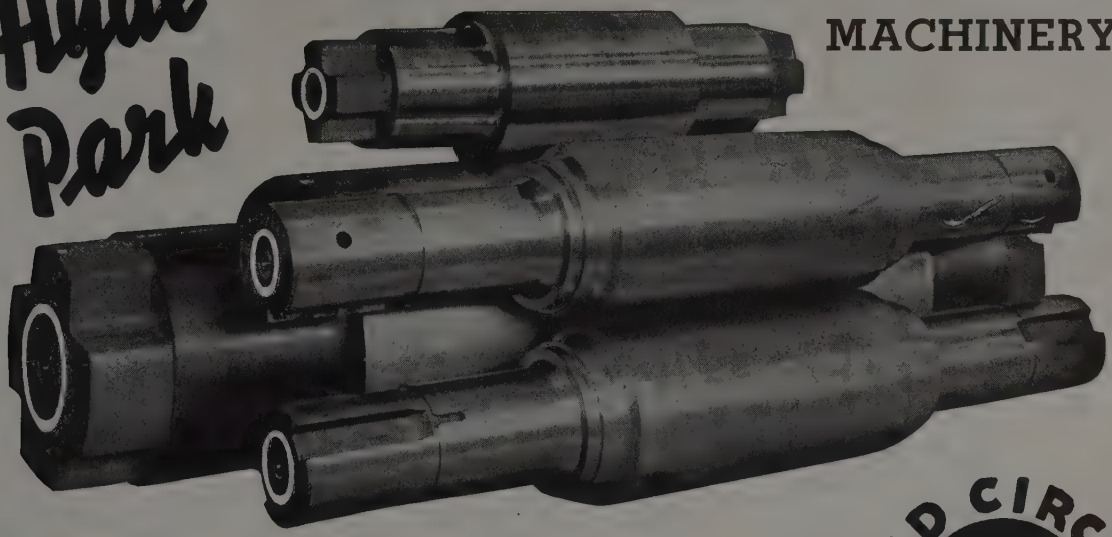
MONTREAL, QUE.—G. R. Prouse Range Co. Ltd., 2025 University Ave., has awarded a $250,000 contract for a 1-story plant and office on Decarie Blvd. to Ross & Auglin Ltd., 802 Dominion Square Bldg. Architect is R. E. Bostrom, 660 St. Catherine St. W.

PORT ALFRED, QUE.—Aluminum Co. of Canada Ltd., Sun Life Bldg., Montreal, has awarded a $175,000 contract for a warehouse to Foundation Co. of Canada Ltd., 1900 Sherbrooke St. W., Montreal.

ST. LAURENT, QUE.—Aviation Products Co. Inc., 1410 Stanley St., Montreal, will build a $60,000 factory. Architect is R. Fisher, 3475 Park Ave., Montreal.

Hyde Park

CHILLED ROLLS and ROLLING MILL MACHINERY



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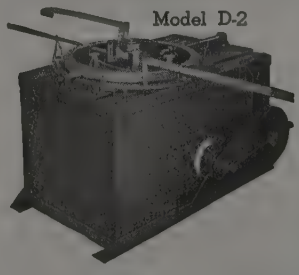
KARDONG FOUR-WAY BENDER

Model D-2



The Model D-2 Kardong Bender is a Four Direction Horizontal bender. With this bender when bending large bars it is not necessary to turn bars over to make reverse or second bends or 180 degree hook bends. The Model D-2 is equipped to bend bars around collars from 2 inch to 6 inch in diameter. Also made to bend up to 8 inch in diameter. Capacity of Model D-2 1¼ inch Square Bars. The Model D-2 is a production bender for concrete reinforcing steel for shop or fabricating plant. Ask for our catalog of our complete line of reinforcing bar benders.

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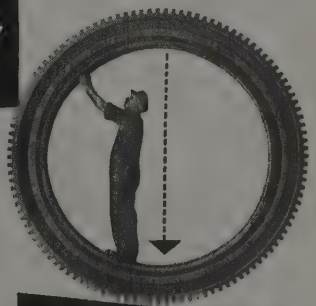

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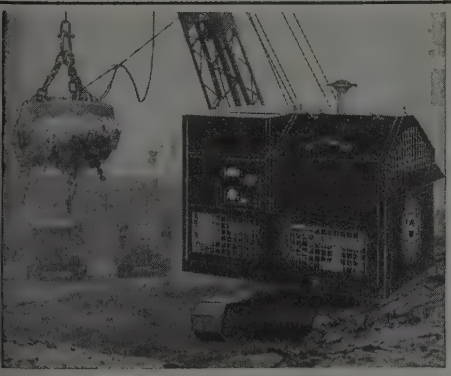

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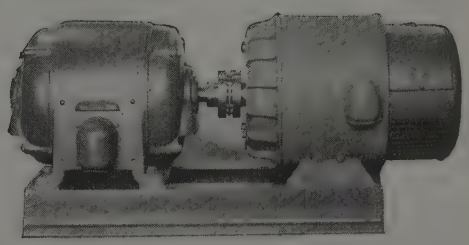

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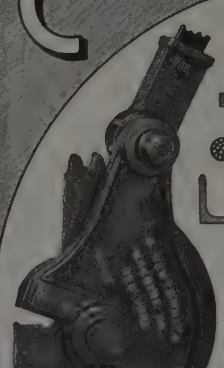

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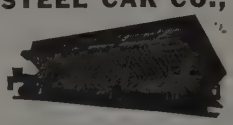

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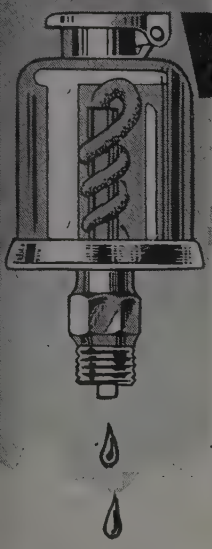

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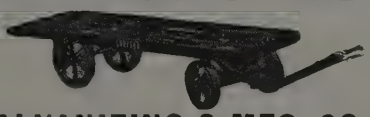

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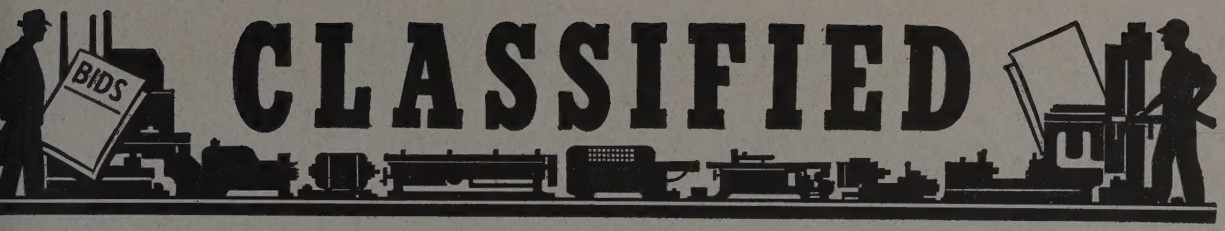

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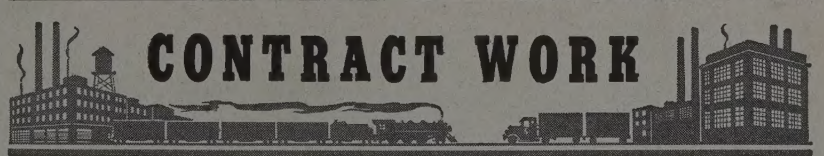

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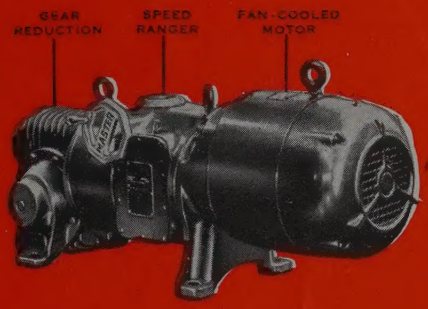

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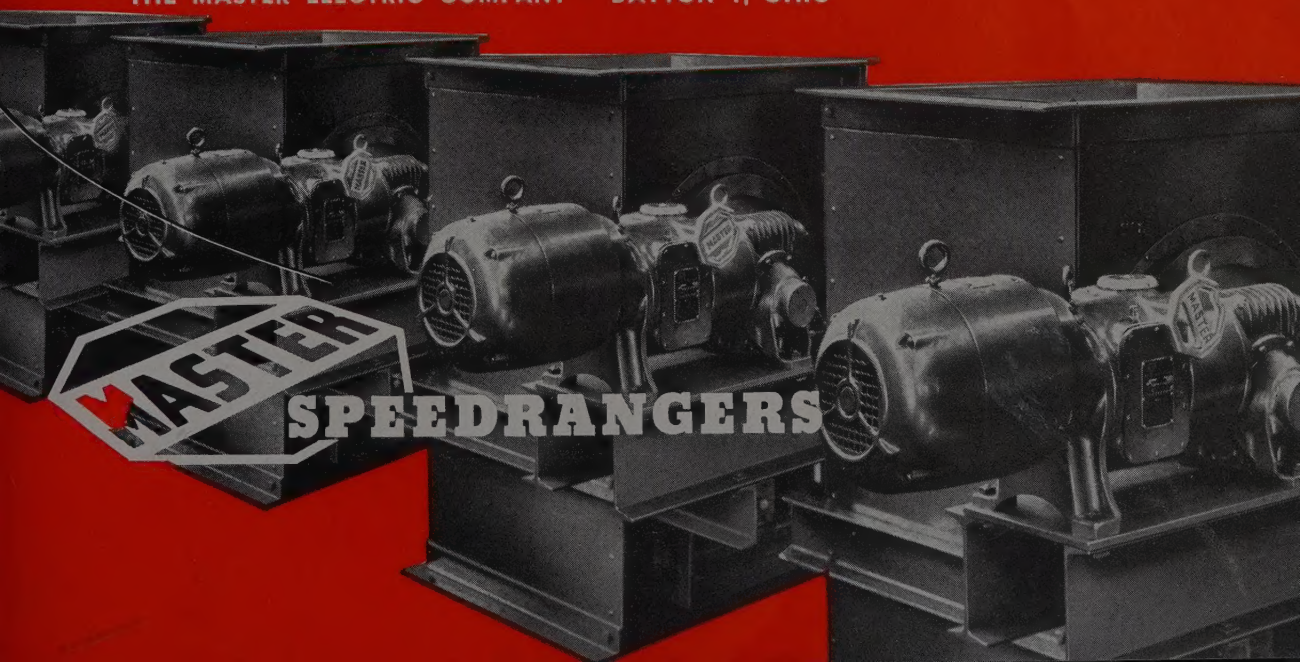

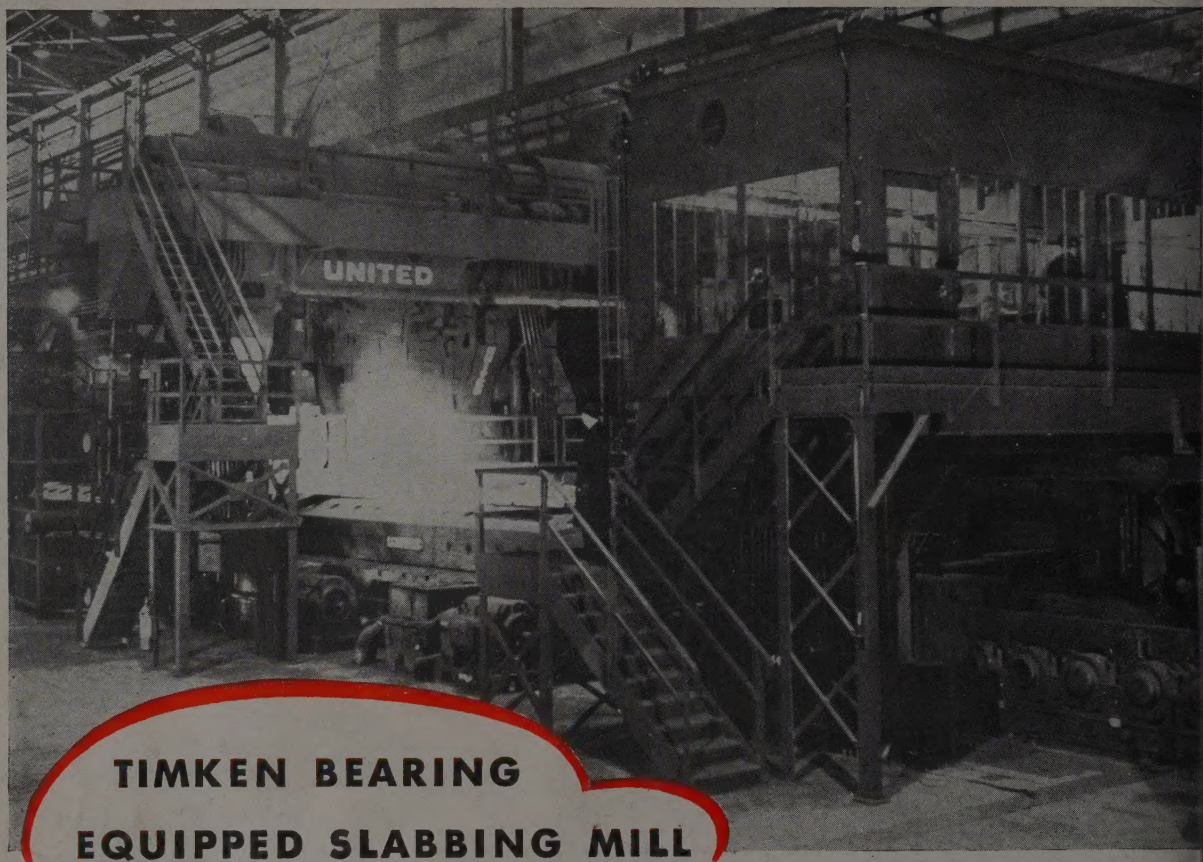

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